



United States Environmental Protection Agency
Washington, DC 20460

Completion Form For Injection Wells

Administrative Information

1. Permittee Florence Copper Inc.	
Address (Permanent Mailing Address) (Street, City, and ZIP Code) 1575 W Hunt Hwy, Florence, AZ 85132	
2. Operator Florence Copper Inc.	
Address (Street, City, State and ZIP Code) 1575 W Hunt Hwy, Florence, AZ 85132	
3. Facility Name Florence Copper Inc.	Telephone Number (520) 374-3984
Address (Street, City, State and ZIP Code) 1575 W Hunt Hwy, Florence, AZ 85132	

4. Surface Location Description of Injection Well(s)	
State Arizona	County Pinal
Surface Location Description SE 1/4 of Sw 1/4 of NE 1/4 of SW 1/4 of Section 28 Township 4S Range 9E	
Locate well in two directions from nearest lines of quarter section and drilling unit	
Surface Location 985 ft. from (N/S) N Line of quarter section and 840 ft. from (E/W) E Line of quarter section.	

Well Activity <input type="checkbox"/> Class I <input type="checkbox"/> Class II <input type="checkbox"/> Brine Disposal <input type="checkbox"/> Enhanced Recovery <input type="checkbox"/> Hydrocarbon Storage <input checked="" type="checkbox"/> Class III <input type="checkbox"/> Other	Well Status <input checked="" type="checkbox"/> Operating <input type="checkbox"/> Modification/Conversion <input type="checkbox"/> Proposed	Type of Permit <input type="checkbox"/> Individual <input checked="" type="checkbox"/> Area : Number of Wells 33
Lease Number NA	Well Number M59-O	

Submit with this Completion Form the attachments listed in Attachments for Completion Form.

Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment (Ref. 40 CFR 144.32)

Name and Official Title (Please type or print) Ian Ream, Senior Hydrogeologist	Signature 	Date Signed 9-12-2018
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PAPERWORK REDUCTION ACT

The public reporting and record keeping burden for this collection of information is estimated to average 49 hours per response for a Class I hazardous facility, and 47 hours per response for a Class I non-hazardous facility. Burden means the total time, effort, or financial resource expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal Agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to the collection of information; search data sources; complete and review the collection of information; and, transmit or otherwise disclose the information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including the use of automated collection techniques to Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed forms to this address.

Attachments to be submitted with the Completion report:

I. Geologic Information

1. Lithology and Stratigraphy

A. Provide a geologic description of the rock units penetrated by name, age, depth, thickness, and lithology of each rock unit penetrated.

B. Provide a description of the injection unit.

- (1) Name
- (2) Depth (drilled)
- (3) Thickness
- (4) Formation fluid pressure
- (5) Age of unit
- (6) Porosity (avg.)
- (7) Permeability
- (8) Bottom hole temperature
- (9) Lithology
- (10) Bottom hold pressure
- (11) Fracture pressure

C. Provide chemical characteristics of formation fluid (attach chemical analysis).

D. Provide a description of freshwater aquifers.

- (1) Depth to base of fresh water (less than 10,000 mg/l TDS).
- (2) Provide a geologic description of aquifer units with name, age, depth, thickness, lithology, and average total dissolved solids.

II. Well Design and Construction

1. Provide data on surface, intermediate, and long string casing and tubing. Data must include material, size, weight, grade, and depth set.
2. Provide data on the well cement, such as type/class, additives, amount, and method of emplacement.
3. Provide packer data on the packer (if used) such as type, name and model, setting depth, and type of annular fluid used.

4. Provide data on centralizers to include number, type and depth.

5. Provide data on bottom hole completions.

6. Provide data on well stimulation used.

III. Description of Surface Equipment

1. Provide data and a sketch of holding tanks, flow lines, filters, and injection pump.

IV. Monitoring Systems

1. Provide data on recording and nonrecording injection pressure gauges, casing-tubing annulus pressure gauges, injection rate meters, temperature meters, and other meters or gauges.

2. Provide data on constructed monitor wells such as location, depth, casing diameter, method of cementing, etc.

V. Logging and Testing Results

Provide a descriptive report interpreting the results of geophysical logs and other tests. Include a description and data on deviation checks run during drilling.

VI. Provide an as-built diagrammatic sketch of the injection well(s) showing casing, cement, tubing, packer, etc., with proper setting depths. The sketch should include well head and gauges.

VII. Provide data demonstrating mechanical integrity pursuant to 40 CFR 146.08.

VIII. Report on the compatibility of injected wastes with fluids and minerals in both the injection zone and the confining zone.

IX. Report the status of corrective action on defective wells in the area of review.

X. Include the anticipated maximum pressure and flow rate at which injection will operate.

TECHNICAL MEMORANDUM

17 September 2018
File No. 129687-010

TO: Florence Copper Inc.
Ian Ream, Senior Hydrogeologist

FROM: Haley & Aldrich, Inc.
Lauren Candreva, R.G.

Subject: Drilling, Installation, and Integrity Testing Summary
PTF Supplemental Monitoring Well M59-O
Florence Copper Inc., Florence, Arizona



This document summarizes the drilling, installation, and testing of Production Test Facility (PTF) supplemental monitoring well M59-O for Florence Copper Inc. (Florence Copper) in Florence, Arizona, including the equipment used to perform the work, completion, and the results of well testing activities. Separate well completion reports have been created for each PTF well.

The Arizona Department of Water Resources Registry ID for well M59-O is 55-226791; the Well Registry Report is included in Appendix A. The well is located in the southwest quarter of the northeast quarter of the southwest quarter of Section 28 of Township 4 north, Range 9 East of the Gila and Salt River Baseline and Meridian (D(4-9)28CAC). The well is located within the Underground Injection Control (UIC) Permitted Area of Review (AOR) for UIC Permit R9UIC-AZ3-FY11-1 and was completed as a Class III supplemental monitoring well for the PTF (Figure 1).

Florence Copper contracted National Exploration, Wells, and Pumps (National EWP) to drill, install, and test well M59-O in accordance with *Bid Specification: Installation, of Class III Monitoring Wells, Production Test Facility, Florence, Arizona* (Haley & Aldrich, Inc. [Haley & Aldrich], 2015). A Schramm T685WS drilling rig was used for all drilling and construction activities. Haley & Aldrich provided intermittent oversight of drilling activities and provided complete oversight during key activities such as geophysical logging, well installation, and testing. All reported depths are in feet below ground surface unless otherwise noted.

I. Geologic Information

1. Lithology and Stratigraphy

A. Geology of Penetrated Units

The geology penetrated during the drilling of the Class III well M59-O is summarized below; a lithologic log is included in Appendix B.

Lithologic Unit Name	Depth to Bottom of Unit (feet)	Thickness of Unit (feet)	Lithology and Age of Unit
Upper Basin Fill Unit (UBFU)	285	285	Alluvium; Quaternary to Tertiary
Middle Fine-Grained Unit (MFGU)	305	20	Alluvium; Tertiary
Lower Basin Fill Unit (LBFU)	465	160	Alluvium; Tertiary to Cretaceous
Bedrock Oxide Unit (Oxide)	Not encountered	>748	Igneous porphyry; Precambrian

B. Description of Injection Unit

Name	Bedrock Oxide Unit
Depth Drilled	1,213 feet
Thickness	>748 feet
Formation Fluid Pressure	Atmospheric plus head of freshwater; no additional formation pressure
Age of Unit	Precambrian with intrusions of Precambrian to Tertiary rocks
Porosity ¹	Approximately 6 to 8.5%
Permeability	Hydraulic conductivity = 0.56 feet per day
Bottom Hole Temperature	31.0 degrees Celsius
Lithology	Igneous porphyry: quartz monzonite, granodiorite with diabase and andesite dykes (detailed log included in Appendix B)
Bottom Hole Pressure	Approximately 430 pounds per square inch (PSI) (pressure exerted by the column of freshwater with no additional contribution from formation pressure)
Fracture Pressure	0.65 PSI per foot
¹ Porosity values for the bedrock oxide unit are approximate values from calculated neutron porosity values from injection well borehole surveys.	

C. Chemical Characteristics of Formation Fluid

The chemical characteristics of the formation fluid in the injection zone are summarized below and are the sampling results from the center PTF wellfield well, R-09. The table below summarizes the primary chemical characteristics detected in a formation fluid sample collected on 23 April 2018; the complete analytical report is included in Appendix C.

Analyte	Result (mg/L)
Metals	
Aluminum	<0.08
Antimony	<0.005
Arsenic	0.0016
Barium	0.071
Beryllium	<0.0005
Cadmium	<0.00025
Calcium	140
Chromium	0.0051
Cobalt	<0.00025
Copper	0.011
Iron	<0.30
Lead	<0.0005
Magnesium	27
Manganese	0.002
Mercury	<0.001
Nickel	0.0033
Potassium	6.8
Selenium	<0.0025
Sodium	170
Thallium	<0.0005
Zinc	<0.04
Anions	
Bicarbonate	150
Chloride	310
Fluoride	<0.5
Nitrate	8.8
Sulfate	190
Field Parameters	
Total Dissolved Solids	1,000
pH	7.8
Radiochemicals	
Uranium	0.016
Notes: mg/L = milligrams per liter	

Water quality of each PTF monitoring well, including well M59-O, is summarized in *Procedures for Determining Alert Levels and Aquifer Quality Limits for Groundwater Compliance Monitoring* (Brown and Caldwell, 2018).

D. Description of Freshwater Aquifers

- 1) The depth to the base of the freshwater aquifer is defined by the interface where deeper formation fluid exhibits a total dissolved solids (TDS) value of 10,000 milligrams per liter (mg/L). The depth of the 10,000 mg/L interface is deeper than all of the wells drilled at the site and consequently has not been defined.
- 2) A geologic description of the aquifer units is included below:

Aquifer Unit Name	Age	Depth (feet)	Thickness (feet)	Lithology	Average Total Dissolved Solids ¹ (mg/L)
UBFU	Quaternary/Tertiary	0 to 285	285	Alluvium	914
LBFU	Tertiary	305 to 465	160	Alluvium	754
¹ Average TDS values calculated from UBFU and LBFU monitoring well ambient monitoring results near the PTF.					

II. Well Design and Construction

1. Well M59-O Casing Installed

Casing	Material	Diameter (inches)	Weight (pounds per foot)	Depth (feet)	Borehole Diameter (inches)	Drilling Method
Surface	Mild steel	14 O.D. 13¾ I.D.	47.36	0 to 40	17½	Conventional mud rotary
Well casing	Mild steel	5.66 O.D. 5.14 I.D.	5.40	-2.1 to 534	10⅝	Conventional mud rotary
Screen	PVC Sch. 80 with 0.020-inch wide slots	5.56 O.D. 4.81 I.D.	4.08	534 to 1,199	10⅝	Conventional mud rotary
Notes: <i>I.D. = inside diameter</i> <i>O.D. = outside diameter</i> <i>PVC = polyvinyl chloride</i> <i>Sch. = Schedule</i>						

2. Well Cement

Cement Interval	Cement Type	Additives	Amount Installed (cubic yards)	Method of Emplacement
Surface casing	Type V Neat 21 sack slurry	None	1.5 ¹	Submerged tremie
Well casing	Type V Neat 21 sack slurry	None	9.3	Submerged tremie

¹ Cement for the surface casing was mixed by the drilling contractor on-site, volume estimated.

Field forms documenting pipe tallies, annular materials, and cement tickets are included in Appendix D.

3. Annular Packers

No annular packers were used during construction of well M59-O.

4. Centralizers

Casing	Centralizer Type	Number and Spacing
Well – FRP and PVC	Stainless steel – heavy duty	31 installed – every 40 feet

Notes:
FRP = fiberglass reinforced plastic
PVC = polyvinyl chloride

5. Bottom Hole Completion

There is no bottom hole completion, as this is not an oil/gas well. The well was completed at the bottom with a stainless-steel endcap of the same diameter as the well screen.

6. Well Stimulation

No well stimulation was used during the drilling and construction of well M59-O.

III. Description of Surface Equipment

1. Surface Equipment

Well M59-O is a supplemental monitoring well and has been equipped with a pressure transducer for monitoring water levels and a low-flow pump for collecting water quality samples. There is no surface equipment beyond the well casing stick-up and locking well vault. An as-built diagram of the well is included as Figure 2.

IV. Monitoring Systems

1. Well Monitoring Equipment

Well M59-O is a monitoring well and does not have any monitoring systems for injection. A pressure transducer with a data logger is installed in the well to collect water levels for compliance reporting.

2. Monitoring Wells

A total of 16 monitoring wells (including well M59-O) are associated with the PTF: 7 point-of-compliance (POC) wells, 7 United States Environmental Protection Agency (USEPA) supplemental monitoring wells, and 2 operational monitoring wells. The POC wells are located outside the AOR and are not constructed as Class III wells. The supplemental monitoring and operational monitoring wells are located within the AOR and are constructed as Class III wells as required by the UIC Permit. The wells are summarized in the tables below by type.

POC Wells						
Well ID	Location X/Y (State Plane NAD 83)	Depth (feet)	Well Nom. Diameter (inches)	Cementing Method	Screened Interval (feet)	Screened Lithologic Unit
M14-GL	846750.23 746461.52	859	5 9/16 OD	Submerged tremie	778 to 838	LBFU
M15-GU	846697.17 746464.82	615	5 9/16 OD	Submerged tremie	554 to 594	LBFU
M22-O	846751.26 746514.47	1,140	5 9/16 OD to 528 feet; 4½ OD to 1,140 feet	Submerged tremie	932 to 1,130	Oxide
M23-UBF	846688.13 746512.48	250	6½ OD	Submerged tremie	210 to 250	UBFU
M52-UBF	851092.00 774178.00	274	5 9/16	Submerged tremie	198 to 273	UBFU
M54-LBF	847331.96 746682.61	630	5 9/16	Submerged tremie	310 to 629	LBFU
M54-O	847342.99 746702.36	1,199	5 9/16	Submerged tremie	668 to 1,198	Oxide
OD = outside diameter						

Supplemental Monitoring Wells						
Well ID	Location X/Y (State Plane NAD 83)	Depth (feet)	Well Nom. Diameter (inches)	Cementing Method	Screened Interval (feet)	Screened Lithologic Unit
M55-UBF	847541.46 746280.63	261	5	Submerged tremie	240 to 260	UBFU
M56-LBF	847518.70 746303.41	340	5	Submerged tremie	320 to 340	LBFU
M57-O	847378.37 746248.93	1,200	5	Submerged tremie	523 to 1,199	Oxide
M58-O	847672.23 746595.97	1,200	5	Submerged tremie	594 to 1,199	Oxide
M59-O	847934.95 746218.89	1,201	5	Submerged tremie	534 to 1,199	Oxide
M60-O	847599.37 745903.70	1,201	5	Submerged tremie	444 to 1,200	Oxide
M61-LBF	848184.46 746148.88	629	5	Submerged tremie	429 to 629	LBFU

Operational Monitoring Wells						
Well ID	Location X/Y (State Plane NAD 83)	Depth (feet)	Well Nom. Diameter (inches)	Cementing Method	Screened Interval	Screened Lithologic Unit
MW-01-LBF	847487.97 746360.54	444	5	Submerged tremie	330 to 440	LBFU
MW-01-O	847499.04 746369.31	1,200	5	Submerged tremie	500 to 1,200	Oxide

V. Logging and Testing Results

Borehole geophysical logging was conducted on well M59-O in two phases: 1) open-hole surveys in the 12.25-inch borehole prior to installation of the well casing and screen, and 2) cased-hole surveys in the completed well.

The open-hole geophysical surveys completed at well M59-O included:

- Spontaneous potential;
- Natural gamma;
- Electrical resistivity (short and long normal);
- Caliper with calculated volume;

- Temperature;
- Sonic; and
- Deviation.

The cased-hole geophysical surveys completed included:

- Cement bond log;
- Sonic (for cement evaluation);
- 4 pi density (for cement evaluation);
- Dual density (for cement evaluation);
- Natural gamma;
- Fluid conductivity; and
- Temperature.

Open-hole geophysical surveys were used to support identification of the lithologic contacts, to evaluate the condition of the borehole, and to evaluate the deviation of the borehole.

The primary logs used to evaluate lithologic contacts were natural gamma ray, short (16-inch) and long (64-inch) normal electrical resistance, and single-point resistance.

The lithologic contacts for the Middle Fine-Grained Unit (MFGU) were selected based on the short and long resistance and the single-point resistance. All the resistivity values decreased and remained consistently low through the MFGU. This contact is generally characterized by a relatively sharp decrease in resistance at the top of the unit and a gradual increase in resistance below the bottom of the unit.

The contact between the Lower Basin Fill Unit (LBFU) and the bedrock was identified primarily using the natural gamma and correlated with the resistance logs. There is a consistent increase in gamma values at the contact between the LBFU and the bedrock that was identified and documented at the site during exploration in the 1990s. For well M59-O, the gamma values are consistent at approximately 60 American Petroleum Institute (API) units throughout the Upper Basin Fill Unit (UBFU), increase slightly to approximately 70 to 80 API units in the MFGU through the LBFU, and increase at approximately 465 to over 160 API units. After the increase at approximately 465 feet, the natural gamma values begin to vary more than in the alluvial units. This change in the response of the natural gamma indicates the contact with the bedrock unit. Also, at this approximate depth, the resistance increases, likely because the bedrock contains less water, leading to increased resistivity.

Cased-hole geophysical surveys were conducted to evaluate the cement seal and the casing-cement bond, to document baseline fluid temperature and conductivity, and to evaluate the plumbness of the well. The cement bond is discussed in Section VII.

Copies of all the geophysical logs are included in Appendix E; a figure summarizing the open-hole logs used to evaluate the geology is included as Figure 3.

VI. Well As-Built Diagram

An as-built diagram for well M59-O is included as Figure 2.

VII. Demonstration of Mechanical Integrity

A demonstration of Part I mechanical integrity of the well was completed using a standard annular pressure test (SAPT) in accordance with Part II.E.3.a.i.A of the UIC Permit. Mechanical integrity will be demonstrated every 2 years during operations. The SAPT for well M59-O is summarized below.

The SAPT was conducted by installing an inflatable packer in the well secured with a threaded well seal at the surface. The packer was installed near the bottom of the FRP-cased portion of the well and the wellhead was equipped with a water-tight threaded wellhead; the packer was inflated to form a seal against the casing. The bottom 5 feet of the packer drop pipe was perforated to allow for communication between the tubing and the annulus of the packer assembly. The drop pipe extended through the wellhead and a high pressure/low volume pump was attached to the drop pipe to pressurize the test interval. A valve on the drop pipe at the surface was used to isolate the test interval once the planned test pressure was achieved.

An In-Situ LevelTROLL® pressure transducer with a data logger was installed at the well head and connected to the packer assembly annulus interval via a National Pipe Thread adapter. The LevelTROLL was used to monitor and record pressure inside the well during the SAPT. To conduct the SAPT, water was pumped from a nearby well immediately prior to testing. Before the water was pumped into the test well, the water temperature was measured to ensure that it was similar to the ambient groundwater temperature of the test well to reduce the potential for differential temperature effects on the well casing. The SAPT for the Class III well was conducted by applying hydraulic pressure to the well casing and shutting in pressure between the packer and wellhead assembly, monitoring the shut-in pressure for a 30-minute period, then measuring the volume of water returned from the well casing after the pressure was released.

On 13 June 2017, the packer was installed to approximately 504 feet and the SAPT was conducted successfully two times. The USEPA SAPT form, a table of the data, and a chart of the data is provided in Appendix F.

Part II mechanical integrity is demonstrated by the cementing records included in this report (in accordance with Part II.E.3.ii.C of the UIC Permit) and will be demonstrated during operations by annular conductivity monitoring on the observation and multi-level sampling wells (in accordance with Part II.E.3.a.ii.A of the UIC Permit).

Cemented Interval	Cement Type	Calculated Grout Volume (cubic yards)	Installed Grout Volume (cubic yards)
Surface casing	Type V 21 sack neat cement slurry	0.9	1.5 ¹
Well casing	Type V 21 sack neat cement slurry	9.1	9.3
¹ Cement for the surface casing was mixed by the drilling contractor on-site, volume estimated.			

On 12 April 2017, a cement bond log was run over the entire length of the completed well to verify the grout seal. A summary of the logs completed to demonstrate cement bond are included in Appendix G.

The cement bond of the steel casing at well M59-O was evaluated by the geophysical contractor by running a cement bond log and calculating a bond index. The bond index was calculated to be greater than 90 percent over the cement grouted interval from approximately 250 feet (static water level) to 488 feet. In addition to the cement bond, density data was collected to evaluate the unsaturated interval; the density data indicate that there are no significant cement deficiencies at well M59-O in the cement interval. The bond and density are decreased below 488 feet. There is no apparent reason for the decreased density, the cement volume installed exceeded the calculated volume and the grout was installed with the tremie on bottom in one lift. The bond data is included on the summary log in Appendix G.

VIII. Compatibility of Injected Waste

The Florence Copper Project is a Class III mineral extraction project and does not include the injection of any waste products of any kind. The injected fluid (lixiviant) is a carefully constituted in-situ copper recovery solution that will be recovered and recycled following injection.

The compatibility of the lixiviant was evaluated as part of the geochemical modeling completed by Florence Copper and summarized in the *Geochemical Evaluation to Forecast Composition of Process Solutions for In-Situ Copper Recovery Pilot Test Facility at Florence Copper, Florence Arizona* (Daniel B. Stephens Inc., 2014) which was included in Attachment H of the UIC Permit Application.

IX. Status of Corrective Action on Defective Wells in the Area of Review

There are not currently any defective wells in the AOR.

X. Maximum Pressures and Flow Rates for M59-O

Maximum Operating Pressure	Maximum Flow
Atmospheric	Not applicable – monitoring well

This well is a monitoring well used to monitor water quality near the PTF. No fluids will be injected.

XI. Well Development

Well M59-O was initially developed by the airlift method, followed by pump development. Development activities were completed by National using a workover rig. On 3 April 2017, an airline was temporarily installed to a depth ranging from 400 to 1,170 feet and airlift development of the well was conducted at approximately 2 gallons per minute (gpm) to purge drilling fluids and solids from the well. During airlift development, the airlift pump was turned on and off to surge the well. Approximately 5 gallons of AquaClear PFD® polymer dispersant was swabbed into the screened interval of the well at the end of airlift development, which was conducted for 13 hours. The discharge was turbid but sand-free at the end of the airlift development period.

To pump develop the well, a submersible pump was temporarily installed on 6 April 2017 to a depth of 1,180 feet. Prior to pumping, the static water level was approximately 242 feet. Pump development was conducted at approximately 17 to 20 gpm; the submersible pump was periodically turned off to surge the well during development. Pump development continued for a total of approximately 40 hours over a 5-day period, and was concluded on 10 April 2017, at which time the discharge was sand-free with turbidity values less than 10 Nephelometric Turbidity Units. Well development forms are included in Appendix H.

XII. Well Completion

A well video survey was conducted on 5 June 2017; the video log report is included in Appendix I. The video log depths are presented in feet below the top of the casing and thus vary slightly from what is recorded; however, these values are the same with the correction for stick up.

The video log indicates that the top of fill in the well is at 1,190 feet.

The surveyed location for well M59-O is as follows:

Northing (feet)	Easting (feet)	Measuring Point Elevation (feet amsl)
746218.89	847934.95	1480.19
Notes: <i>Northing and easting locations provided in State Plane North American Datum 1983; vertical location provided in North American Vertical Datum 1988. amsl = above mean sea level</i>		

XIII. Downhole Equipment

Permanent equipment installed in well M59-O includes the following:

- QED® low-flow sampling pump hung on drop tubing (pump at 950 feet); and
- Pressure transducer.

The type and depth of equipment installed in each well is not constrained by the UIC Permit or the Aquifer Protection Permit (APP). This information is provided in accordance with Section 2.7.4.3 of the APP. Operational considerations may require that the type and depth of equipment be changed in response to conditions observed during operations.

XIV. References

Brown and Caldwell, Inc., 2018. *Procedures for Determining Alert Levels and Aquifer Quality Limits for Groundwater Compliance Monitoring, Florence Copper Project, Florence, Arizona*. June.

Daniel B. Stephens, Inc., 2014. *Geochemical Evaluation to Forecast Composition of Process Solutions for In-Situ Copper Recovery Pilot Test Facility at Florence Copper, Florence Arizona*. Prepared for Florence Copper. May.

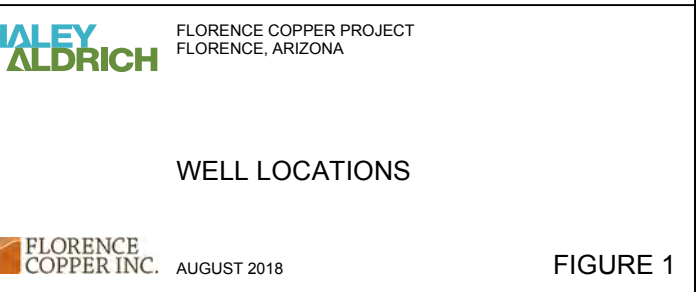
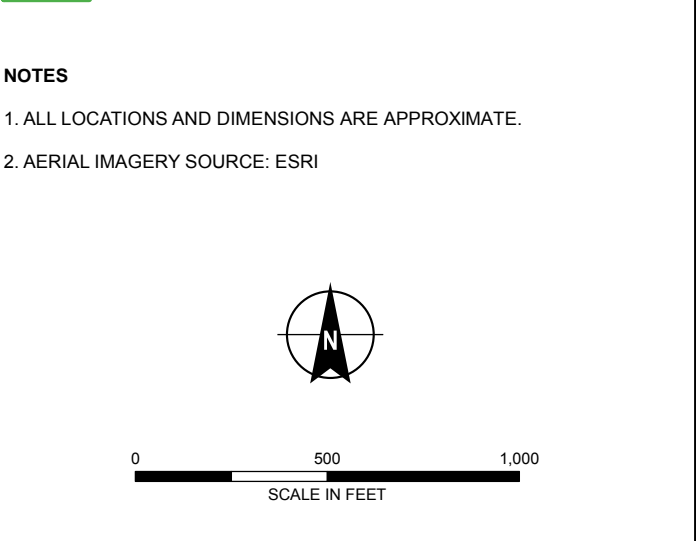
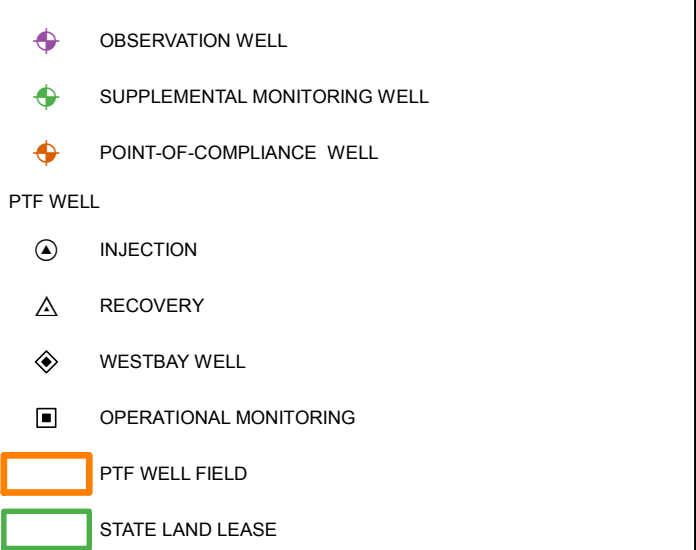
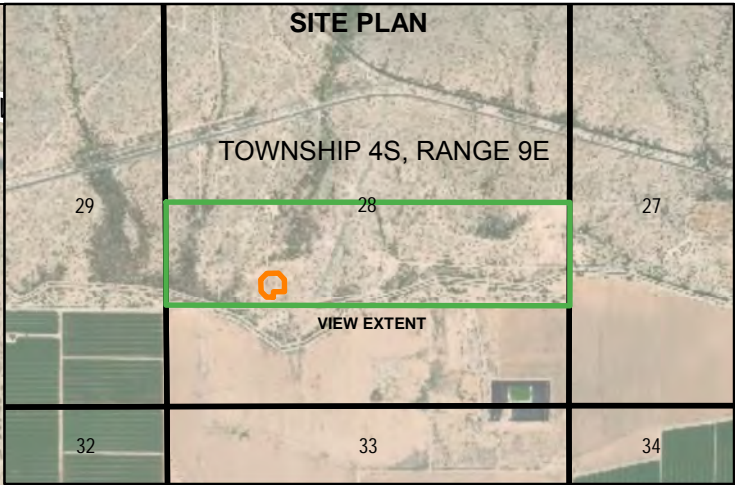
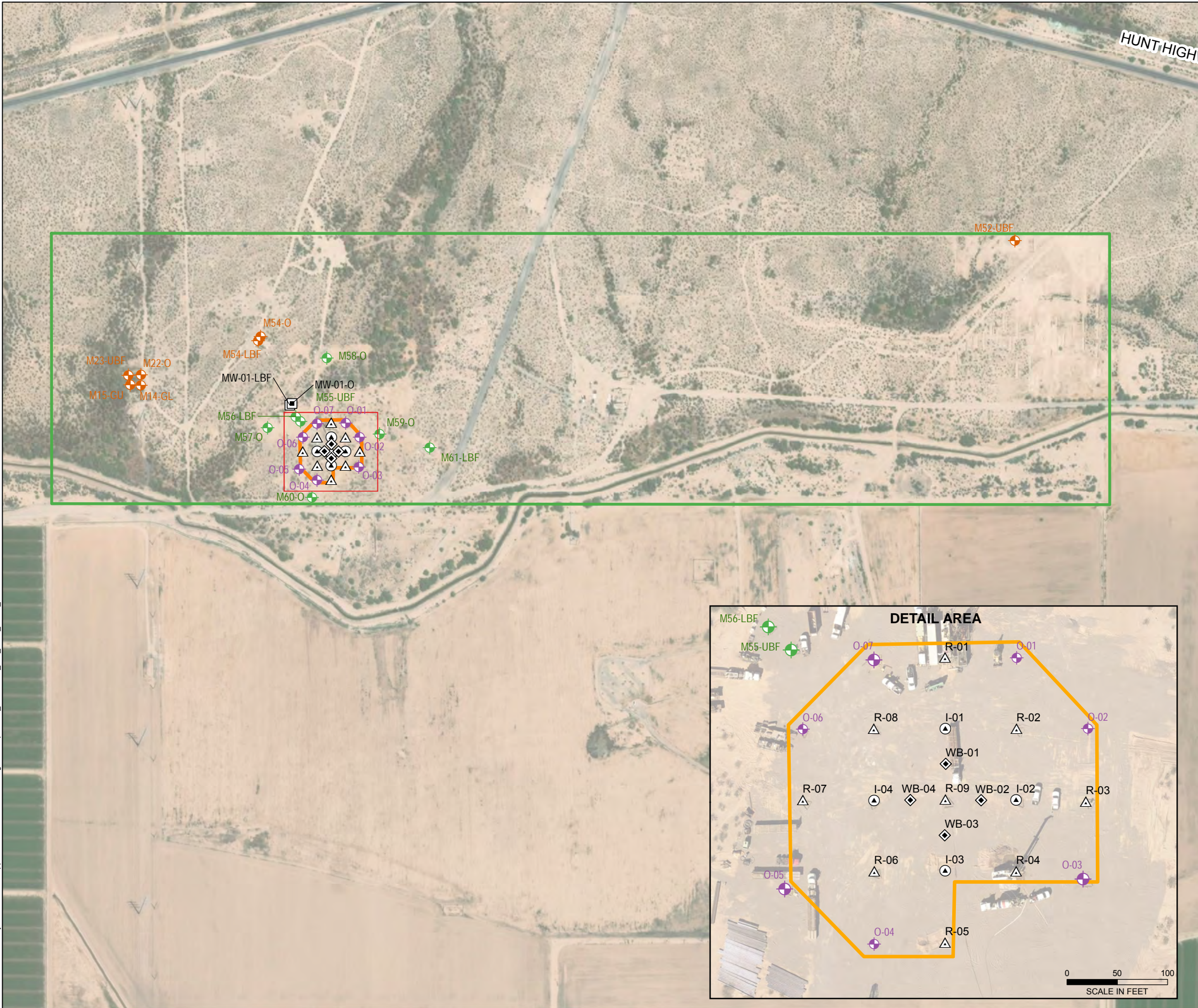
Haley & Aldrich, Inc., 2017. *Bid Specification: Installation, of Class III Monitoring Wells, Production Test Facility, Florence, Arizona*. Revised September 2017.

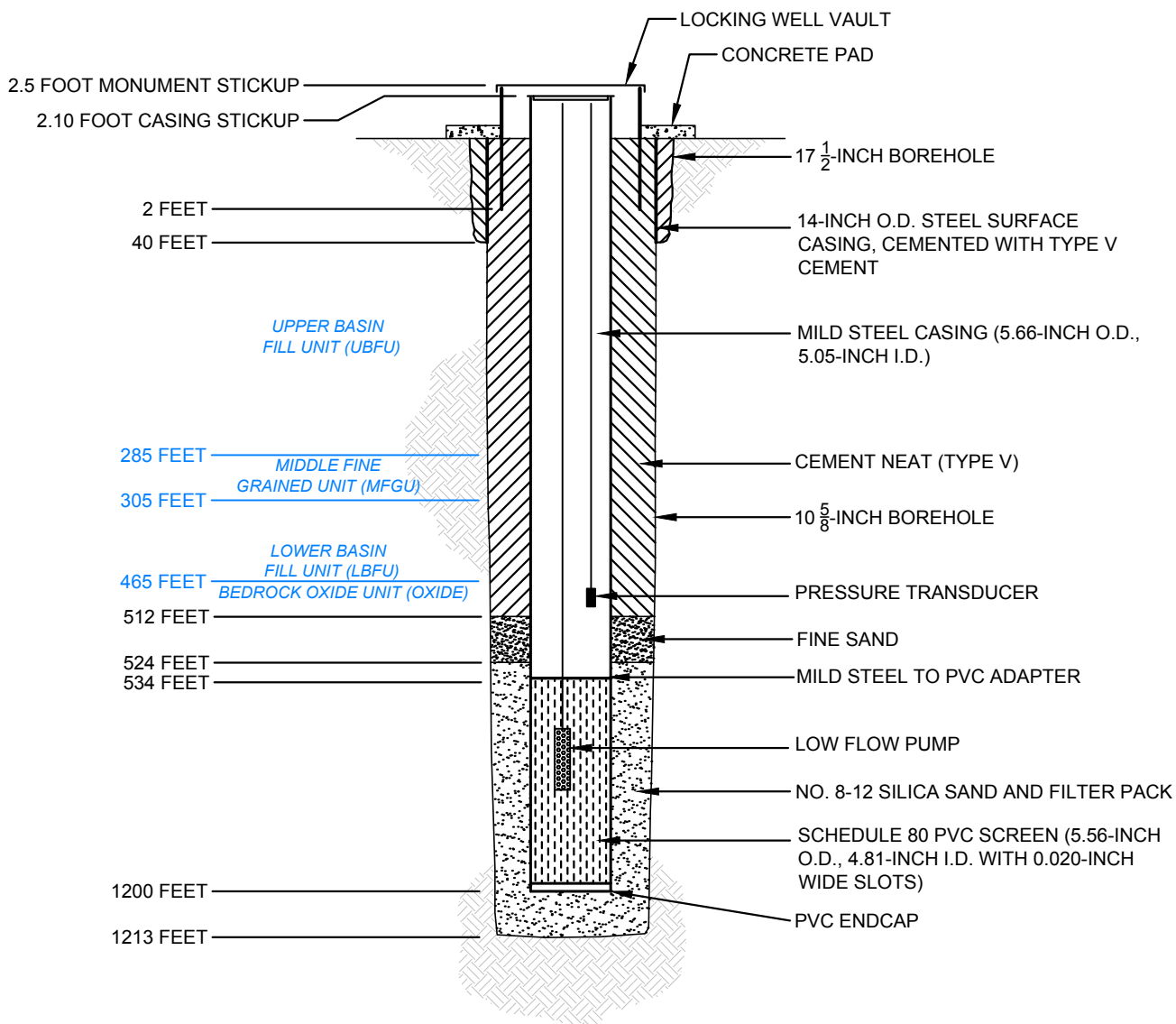
Enclosures:

- Figure 1 – Well Locations
- Figure 2 – M59-O Supplemental Monitoring Well As-Built Diagram
- Figure 3 – Geophysical Data and Lithologic Log
- Appendix A – Arizona Department of Water Resources Well Registry Report
- Appendix B – Lithologic Log
- Appendix C – Chemical Characteristics of Formation Water
- Appendix D – Well Completion Documentation
- Appendix E – Geophysical Logs
- Appendix F – SAPT Documentation
- Appendix G – Cement Bond Log Summary
- Appendix H – Well Development Field Forms
- Appendix I – Well Video Log

FIGURES

GIS FILE PATH: G:\Projects\Florence Copper\129687 PTF Well Drilling\GIS\Maps\2018_07129687_010_A001_WELL_LOCATIONS.mxd — USER: dfm — LAST SAVED: 7/17/2018 10:24:09 AM





NOTES

1. WELL REGISTRATION NO.: 55-226791
2. CADASTRAL LOCATION: D (4-9) 28 CAC
3. TOP OF CASING ELEVATION: 1480.19' AMSL
4. CONCRETE PAD ELEVATION: 1478.55' AMSL
5. I.D. = INSIDE DIAMETER
6. O.D. = OUTSIDE DIAMETER
7. PVC = POLYVINYL CHLORIDE

**HALEY
ALDRICH**

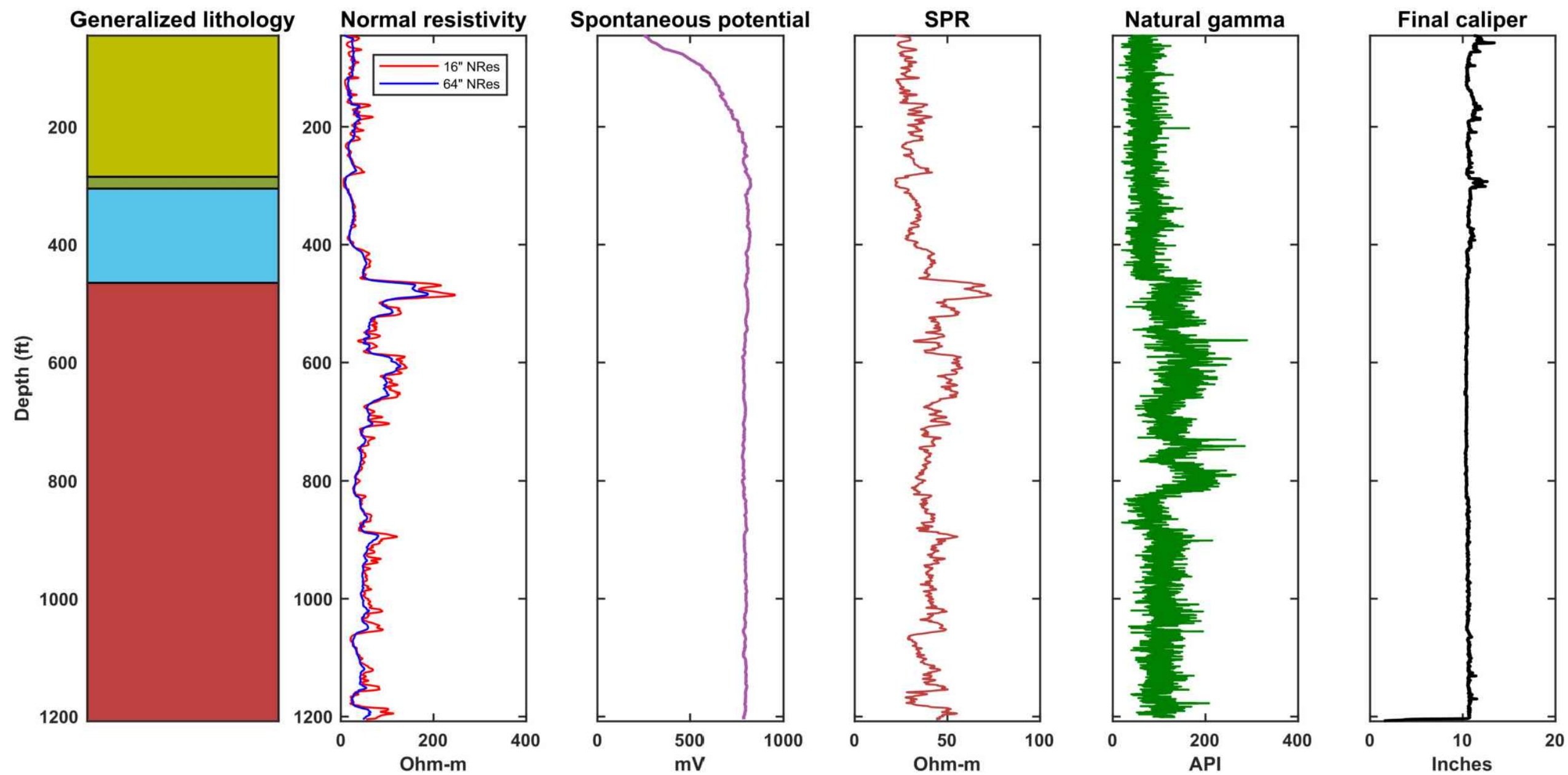
PRODUCTION TEST FACILITY
FLORENCE COPPER, INC.
FLORENCE, ARIZONA

M59-O SUPPLEMENTAL MONITORING WELL AS-BUILT DIAGRAM

**FLORENCE
COPPER INC.**

SCALE: NOT TO SCALE
SEPTEMBER 2018

FIGURE 2



PRODUCTION TEST FACILITY
FLORENCE COPPER, INC.
FLORENCE, ARIZONA

M59-O SUPPLEMENTAL MONITORING
WELL GEOPHYSICAL DATA AND
LITHOLOGIC LOG



SCALE: AS SHOWN
SEPTEMBER 2018

FIGURE 3

APPENDIX A

Arizona Department of Water Resources Well Registry Report



Arizona Department of Water Resources
Information Management Unit
PO Box 36020 • Phoenix, Arizona 85067-6020
(602) 771-8527 • 602-771-8500

Well Driller Report and Well Log

9/20/17

THIS REPORT MUST BE FILED WITHIN **30 DAYS** OF COMPLETING THE WELL.

PLEASE PRINT CLEARLY USING BLACK OR BLUE INK

FILE NUMBER
D(4-9) 28 CAC
WELL REGISTRATION NUMBER
55 - 226791
PERMIT NUMBER (IF ISSUED)

SECTION 1. DRILLING AUTHORIZATION

Drilling Firm

Mail To:	NAME	DWR LICENSE NUMBER
	NATIONAL EWP, INC.	823
	ADDRESS	TELEPHONE NUMBER
	1200 W. SAN PEDRO ST.	480-558-3500
	CITY / STATE / ZIP	FAX
	GILBERT, AZ, 85233	

RECEIVED
AUG 9 2017
ARIZONA DEPARTMENT
OF WATER RESOURCES

SECTION 1. REGISTRY INFORMATION

Well Owner

FULL NAME OF COMPANY, ORGANIZATION, OR INDIVIDUAL
FLORENCE COPPER, INC.

MAILING ADDRESS
1575 W. HUNT HWY

CITY / STATE / ZIP
FLORENCE, AZ, 85132

CONTACT PERSON NAME AND TITLE
Ian Ream, Sr. Hydrologist

TELEPHONE NUMBER
520 374-3984

FAX

WELL NAME (e.g., MW-1, PZ-3, lot 25 Well, Smith Well, etc.)
M59-0

Location of Well

WELL LOCATION ADDRESS (IF ANY)
Same as well owner

TOWNSHIP (N/S)	RANGE (E/W)	SECTION	160 ACRE	40 ACRE	10 ACRE
4S	9E	28	SW 1/4	NE 1/4	SW 1/4
LATITUDE			LONGITUDE		
33 °	3 °	2 °N	111 °	26 °	2 °W

METHOD OF LATITUDE/LONGITUDE (CHECK ONE)
☒ *GPS: Hand-Held
☐ USGS Quad Map ☐ Conventional Survey ☐ *GPS: Survey-Grade

LAND SURFACE ELEVATION AT WELL
1478
Feet Above Sea Level

METHOD OF ELEVATION (CHECK ONE)
☒ *GPS: Hand-Held
☐ USGS Quad Map ☐ Conventional Survey ☐ *GPS: Survey-Grade

*IF GPS WAS USED, GEOGRAPHIC COORDINATE DATUM (CHECK ONE)

☒ NAD-83 ☐ Other (please specify)

COUNTY

Pinal

ASSESSOR'S PARCEL ID NUMBER (MOST RECENT)

BOOK
0

MAP
0

PARCEL
0

SECTION 3. WELL CONSTRUCTION DETAILS

Drilling Method

CHECK ONE
☐ Air Rotary
☐ Bored or Augered
☐ Cable Tool
☐ Dual Rotary
☒ Mud Rotary
☐ Reverse Circulation
☐ Driven
☐ Jetted
☐ Air Percussion / Odex Tubing
☐ Other (please specify)

Method of Well Development

CHECK ONE
☒ Airlift
☐ Bail
☐ Surge Block
☐ Surge Pump
☐ Other (please specify)

Condition of Well

CHECK ONE
☐ Capped
☒ Pump Installed

Method of Sealing at Reduction Points

CHECK ONE
☒ None
☐ Packed
☐ Swedged
☐ Welded
☐ Other (please specify)

Construction Dates

DATE WELL CONSTRUCTION STARTED
3.27.2017

DATE WELL CONSTRUCTION COMPLETED
3.28.2017

I state that this notice is filed in compliance with A.R.S. § 45-596 and is complete and correct to the best of my knowledge and belief.

SIGNATURE OF QUALIFYING PARTY

DATE

8-3-17

WELL REGISTRATION NUMBER
55 - 226791

Depth

Water Level Information

Borehole

Installed Casing

Installed Annular Material

Well Driller Report and Well Log

WELL REGISTRATION NUMBER
55 - 226791

SECTION 5. GEOLOGIC LOG OF WELL

[illegible]

WELL REGISTRATION NUMBER
55 - 226791

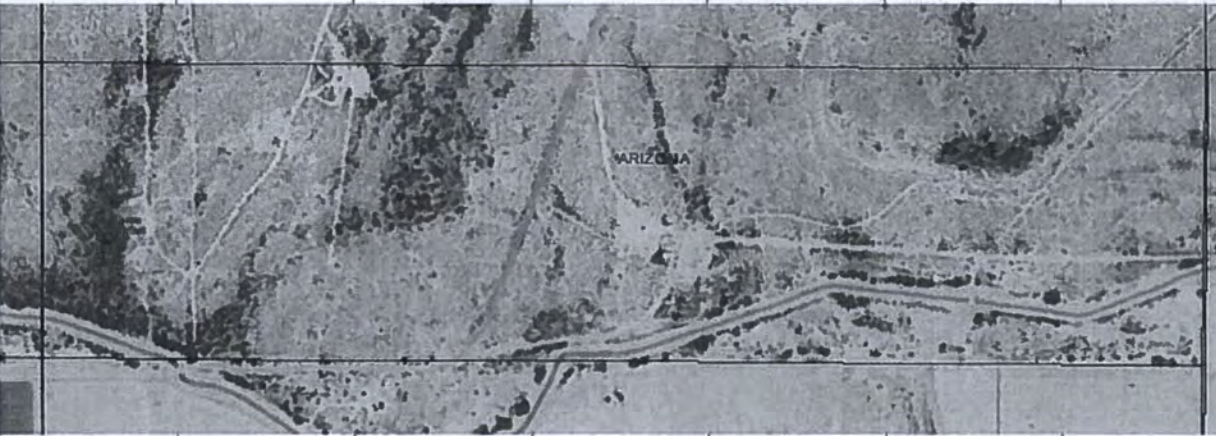
NAME OF WELL OWNER

COUNTY ASSESSOR'S PARCEL ID NUMBER (MOST RECENT)

BOOK

MAP

PARCEL

- 1" = _____ ft
- 
- ARIZONA

Run Date: 01/13/2017

AZ DEPARTMENT OF WATER RESOURCES

WELL REGISTRY REPORT - WELLS55

Location	D	4.0	9.0	28	C	A	C	Well Reg.No	55 - 226791	AMA	PINAL	AMA
----------	---	-----	-----	----	---	---	---	-------------	-------------	-----	-------	-----

Registered Name	FLORENCE COPPER, INC. 1575 W. HUNT HWY FLORENCE	AZ	85132	File Type	NEW WELLS (INTENTS OR APPLICATIONS)	Application/Issue Date	01/11/2017
-----------------	---	----	-------	-----------	-------------------------------------	------------------------	------------

Owner	OWNER	Well Type	ENV - MONITOR
Driller No.	823	SubBasin	ELOY
Driller Name	NATIONAL EWP, INC.	Watershed	UPPER GILA RIVER
Driller Phone	480-558-3500	Registered Water Uses	MONITORING
County	PINAL	Registered Well Uses	MONITOR
		Discharge Method	NO DISCHARGE METHOD LISTED
Intended Capacity GPM	0.00	Power	NO POWER CODE LISTED

Well Depth	0.00	Case Diam	0.00	Tested Cap	0.00
Pump Cap.	0.00	Case Depth	0.00	CRT	
Draw Down	0.00	Water Level	0.00	Log	
		Acres Irrig	0.00	Finish	NO CASING CODE LISTED

Contamination Site: NO - NOT IN ANY REMEDIAL ACTION SITE

Tribe: Not in a tribal zone

Comments Well M59-O
Landownership: AZ State Land Dept. (Mineral Lease #11-026500)
TV

Current Action

1/13/2017	555	DRILLER & OWNER PACKETS MAILED
Action Comment: TNV		

Action History

1/13/2017	550	DRILLING AUTHORITY ISSUED
Action Comment: TNV		
1/11/2017	155	NOI RECEIVED FOR A NEW NON-PRODUCTION WELL
Action Comment: TNV		

ARIZONA DEPARTMENT OF WATER RESOURCES
1110 W. Washington St. Suite 310
Phoenix, Arizona 85007

THIS AUTHORIZATION SHALL BE IN POSSESSION OF THE DRILLER DURING ALL DRILLING OPERATIONS

WELL REGISTRATION NO: 55-226791

AUTHORIZED DRILLER: **NATIONAL EWP, INC.**

LICENSE NO: 823

NOTICE OF INTENTION TO DRILL ENV - MONITOR WELL(S) HAS BEEN FILED WITH THE DEPARTMENT BY:

WELL OWNER: **FLORENCE COPPER, INC. 1575 W. HUNT HWY FLORENCE, AZ, 85132**

THE WELL(S) IS/ARE TO BE LOCATED IN THE:

SW 1/4 of the NE 1/4 of the SW 1/4 Section 28 Township 4.0 SOUTH Range 9.0 EAST

NO. OF WELLS IN THIS PROJECT: 1

THIS AUTHORIZATION EXPIRES AT MIDNIGHT ON THE DAY OF **January 11, 2018**

Sella Muriello

GROUNDWATER PERMITTING AND WELLS

THE DRILLER MUST FILE A LOG OF THE WELL WITHIN 30 DAYS OF COMPLETION OF DRILLING.



ARIZONA DEPARTMENT of WATER RESOURCES
1110 W. Washington St. Suite 310
Phoenix, AZ 85007
602-771-8500
azwater.gov

January 13, 2017

FLORENCE COPPER, INC.
1575 W. HUNT HWY
FLORENCE, AZ 85132



DOUGLAS A. DUCEY
Governor

THOMAS BUSCHATZKE
Director

Registration No. 55- 226791
File Number: D(4-9) 28 CAC

Dear Well Applicant:

Enclosed is a copy of the Notice of Intention to Drill (NOI) a well which you or your driller recently filed with the Department of Water Resources. This letter is to inform you that the Department has approved the NOI and has mailed, or made available for download, a drilling authorization card to your designated well drilling contractor. The driller may not begin drilling until he/she has received the authorization, and must keep it in their possession at the well site during drilling. Although the issuance of this drill card authorizes you to drill the proposed well under state law, the drilling of the well may be subject to restrictions or regulations imposed by other entities.

Well drilling activities must be completed within one year after the date the NOI was filed with the Department. If drilling is not completed within one year, a new NOI must be filed and authorization from this Department received before proceeding with drilling. If the well cannot be successfully completed as initially intended (dry hole, cave in, lost tools, etc.), the well must be properly abandoned and a Well Abandonment Completion Report must be filed by your driller [as required by A.A.C. R12-15-816(F)].

If you change drillers, you must notify the Department of the new driller's identity on a Request to Change Well Information (form 55-71A). Please ensure that the new driller is licensed by the Department to drill the type of well you require. A new driller may not begin drilling until he/she receives a new drilling authorization card from the Department.

If you find it necessary to change the location of the proposed well(s), you may not proceed with drilling until you file an amended NOI with the Department. An amended drilling authorization card will then be issued to the well drilling contractor, which must be in their possession before drilling begins.

Arizona statute [A.R.S. § 45-600] requires registered well owners to file a Pump Installation Completion Report (form 55-56) with the Department within 30 days after the installation of pumping equipment, if authorized. A blank report is enclosed for your convenience. State statute also requires the driller to file a complete and accurate Well Drillers Report and Well Log (form 55-55) within 30 days after completion of drilling. A blank report form was provided to your driller with the drilling authorization card. You should insist and ensure that all of the required reports are accurately completed and timely filed with the Department.

Please be advised that Arizona statute [A.R.S. § 45-593(C)] requires a registered well owner to notify the Department of a change in ownership of the well and/or information pertaining to the physical characteristics of the well in order to keep this well registration file current and accurate. Any change in well information or a request to change well driller must be filed on a Request to Change Well Information form (form 55-71A) that may be downloaded from the ADWR Internet website at www.azwater.gov.

Sincerely,

Groundwater Permitting and Wells Section

Arizona Department of Water Resources Groundwater Permitting and Wells Section P.O. Box 36020 Phoenix, Arizona 85067-6020 (602) 771-8500 • (602) 771-8690 • www.azwater.gov	Notice of Intent to Drill, Deepen, or Modify a Monitor / Piezometer / Environmental Well	\$150 FEE
---	---	----------------------------

- ❖ Review instructions prior to completing form in black or blue ink.
 - ❖ You must include with your Notice:
 - \$150 check or money order for the filing fee.
 - Well construction diagram, labeling all specifications listed in Section 6 and Section 7.
- Authority for fee: A.R.S. § 45-596 and A.A.C. R12-15-104.

AMA / INA Pin2	B 11	SB 11	FILE NUMBER D(4-9)28 CAC
RECEIVED 1/11/2017	DATE 08	WS UGR	WELL REGISTRATION NUMBER 55 - 226291
ISSUED 1/13/2017	DATE 000	REMEDIAL ACTION SITE	

SECTION 1. REGISTRY INFORMATION

To determine the location of well, please refer to the Well Registry Map (<https://gisweb.azwater.gov/WellRegistry/Default.aspx>) and/or Google Earth (<http://www.earthpoint.us/Townships.aspx>)

Well Type	Proposed Action	Location of Well																		
CHECK ONE <input checked="" type="checkbox"/> Monitor <input type="checkbox"/> Piezometer <input type="checkbox"/> Vadose Zone <input type="checkbox"/> Air Sparging <input type="checkbox"/> Soil Vapor Extraction <input type="checkbox"/> Other (please specify):	CHECK ONE <input checked="" type="checkbox"/> Drill New Well <input type="checkbox"/> Deepen <input type="checkbox"/> Modify WELL REGISTRATION NUMBER (if Deepening or Modifying) 55 -	WELL LOCATION ADDRESS (IF ANY) <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">TOWNSHIP(N/S)</td> <td style="width: 15%;">RANGE (E/W)</td> <td style="width: 15%;">SECTION</td> <td style="width: 15%;">160 ACRE</td> <td style="width: 15%;">40 ACRE</td> <td style="width: 15%;">10 ACRE</td> </tr> <tr> <td>4.0 S</td> <td>9.0 E</td> <td>28</td> <td>SW ¼</td> <td>NE ¼</td> <td>SW ¼</td> </tr> </table> COUNTY ASSESSOR'S PARCEL ID NUMBER <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">BOOK</td> <td style="width: 30%;">MAP</td> <td style="width: 40%;">PARCEL</td> </tr> <tr> <td></td> <td></td> <td>1001</td> </tr> </table> COUNTY WHERE WELL IS LOCATED PINAL	TOWNSHIP(N/S)	RANGE (E/W)	SECTION	160 ACRE	40 ACRE	10 ACRE	4.0 S	9.0 E	28	SW ¼	NE ¼	SW ¼	BOOK	MAP	PARCEL			1001
TOWNSHIP(N/S)	RANGE (E/W)	SECTION	160 ACRE	40 ACRE	10 ACRE															
4.0 S	9.0 E	28	SW ¼	NE ¼	SW ¼															
BOOK	MAP	PARCEL																		
		1001																		

SECTION 2. OWNER INFORMATION

Land Owner	Well Owner (check this box if Land Owner and Well Owner are same <input type="checkbox"/>)
FULL NAME OF COMPANY, ORGANIZATION, OR INDIVIDUAL AZ State Land Dept (Mineral Lease # 11-026500)	FULL NAME OF COMPANY, ORGANIZATION, OR INDIVIDUAL Florence Copper, Inc.
MAILING ADDRESS 1616 W Adams St	MAILING ADDRESS 1575 W Hunt Hwy
CITY / STATE / ZIP CODE Phoenix, AZ 85007	CITY / STATE / ZIP CODE Florence, AZ 85132
CONTACT PERSON NAME AND TITLE Lisa Atkins, State Land Commissioner	CONTACT PERSON NAME AND TITLE Ian Ream, Senior Hydrogeologist
TELEPHONE NUMBER (602) 542-4631	TELEPHONE NUMBER (520) 374-3984
FAX	FAX (520) 374-3999

SECTION 3. DRILLING AUTHORIZATION

Drilling Firm	Consultant (if applicable)
NAME National EWP	CONSULTING FIRM Haley & Aldrich, Inc.
DWR LICENSE NUMBER 823	CONTACT PERSON NAME Mark Nicholls
ROC LICENSE CATEGORY A-4	TELEPHONE NUMBER 602-760-2423
TELEPHONE NUMBER (480) 558-3520	FAX 602-760-2448
FAX 480-558-3525	EMAIL ADDRESS mnicholls@haleyaldrich.com
EMAIL ADDRESS jstephens@nationalewp.com	

SECTION 4.

Questions	Yes	No	Explanation:
1. Are all annular spaces between the casing(s) and the borehole for the placement of grout at least 2 inches?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2-inch annular spaces are special standards required for wells located in and near groundwater contamination sites (such as CERCLA, WQARF, DOD, LUST).
2. Is the screened or perforated interval of casing greater than 100 feet in length?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	100-foot maximum screen intervals are a special standard for wells located in and near groundwater contamination sites (such as CERCLA, WQARF, DOD, LUST).
3. Are you requesting a variance to use thermoplastic casing in lieu of steel casing in the surface seal?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	The wells must be constructed in a vault. Pursuant to A.A.C. R12-15-801 (27) a "vault" is defined as a tamper-resistant watertight structure used to complete a well below the land surface.
4. Is there another well name or identification number associated with this well? (e.g., MW-1, PZ2, 06-04, etc.)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	If yes, please state M59-O
5. Have construction plans been coordinated with the Arizona Department of Environmental Quality?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	If yes, please state agency contact & phone number David Haag, 602-771-4669
6. For monitor wells, is dedicated pump equipment to be installed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	If yes, please state design pump capacity (Gallons per Minute) Low-flow
7. Is this well a new well located in an Active Management Area AND intended to pump water for the purpose of remediating groundwater?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	You must also file a supplemental form A.R.S. § 45-454(c) & (f) unless the well is a replacement well and the total number of operable wells on the site is not increasing. (See instructions)
8. Will the well registration number be stamped on the vault cover or on the upper part of the casing?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	If no, where will the registration number be placed?

Notice of Intent to Drill, Deepen, or Modify a Monitor / Piezometer / Environmental Well

WELL REGISTRATION NUMBER
55 - 226797

SECTION 6. WELL CONSTRUCTION DETAILS

Drill Method		Method of Well Development		Grout Emplacement Method	
CHECK ONE <input type="checkbox"/> Air Rotary <input type="checkbox"/> Bored or Augered <input type="checkbox"/> Cable Tool <input type="checkbox"/> Dual Rotary <input checked="" type="checkbox"/> Mud Rotary <input type="checkbox"/> Reverse Circulation <input type="checkbox"/> Driven <input type="checkbox"/> Jetted <input type="checkbox"/> Air Percussion / Odex Tubing <input type="checkbox"/> Other (please specify):		CHECK ONE <input checked="" type="checkbox"/> Airlift <input type="checkbox"/> Bail <input type="checkbox"/> Surge Block <input type="checkbox"/> Surge Pump <input type="checkbox"/> Other (please specify):		CHECK ONE <input checked="" type="checkbox"/> Tremie Pumped (Recommended) <input type="checkbox"/> Gravity <input type="checkbox"/> Pressure Grout <input type="checkbox"/> Other (please specify):	
DATE CONSTRUCTION TO BEGIN 01/16/2017		Method of Sealing at Reduction Points		Surface or Conductor Casing	
		CHECK ONE <input checked="" type="checkbox"/> None <input type="checkbox"/> Welded <input type="checkbox"/> Swedged <input type="checkbox"/> Packed <input type="checkbox"/> Other (please specify):		CHECK ONE <input type="checkbox"/> Flush Mount in a vault <input checked="" type="checkbox"/> Extends at least 1' above grade	

SECTION 7. PROPOSED WELL CONSTRUCTION PLAN (attach additional page if needed)

Attach a well construction diagram labeling all specifications below.

Borehole			Casing													
DEPTH FROM SURFACE		BOREHOLE DIAMETER (inches)	DEPTH FROM SURFACE		OUTER DIAMETER (inches)	MATERIAL TYPE (T)				PERFORATION TYPE (T)						SLOT SIZE IF ANY (inches)
FROM (feet)	TO (feet)		FROM (feet)	TO (feet)		STEEL	PVC	ABS	IF OTHER TYPE, DESCRIBE	BLANK OR NONE	WIRE WRAP	SHUTTER SCREEN	MILLS	KNIFE	SLOTTED	
0	20	20	0	20	14	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
20	1210	10.5	0	535	5	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
			535	1200	5	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		0.020

Annular Material

DEPTH FROM SURFACE		ANNULAR MATERIAL TYPE (T)							FILTER PACK		
FROM (feet)	TO (feet)	NONE	CONCRETE	NEAT CEMENT OR CEMENT GROUT	CEMENT-BENTONITE GROUT	GROUT	CHIPS	PELLETS	IF OTHER TYPE OF ANNULAR MATERIAL DESCRIBE		
0	515	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
515	525	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
525	1210	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>

IF THIS WELL HAS NESTED CASINGS, SPECIFY NUMBER OF CASING STRINGS

EXPECTED DEPTH TO WATER (Feet Below Ground Surface)

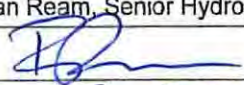
223

SECTION 8. PERMISSION TO ACCESS

☐ By checking this box, I hereby provide ADWR permission to enter the property for the purpose of taking water level measurements at this well. (See instructions.)

SECTION 9. LAND OWNER AND WELL OWNER SIGNATURE

I state that this notice is filed in compliance with A.R.S. § 45-596 and is complete and correct to the best of my knowledge and

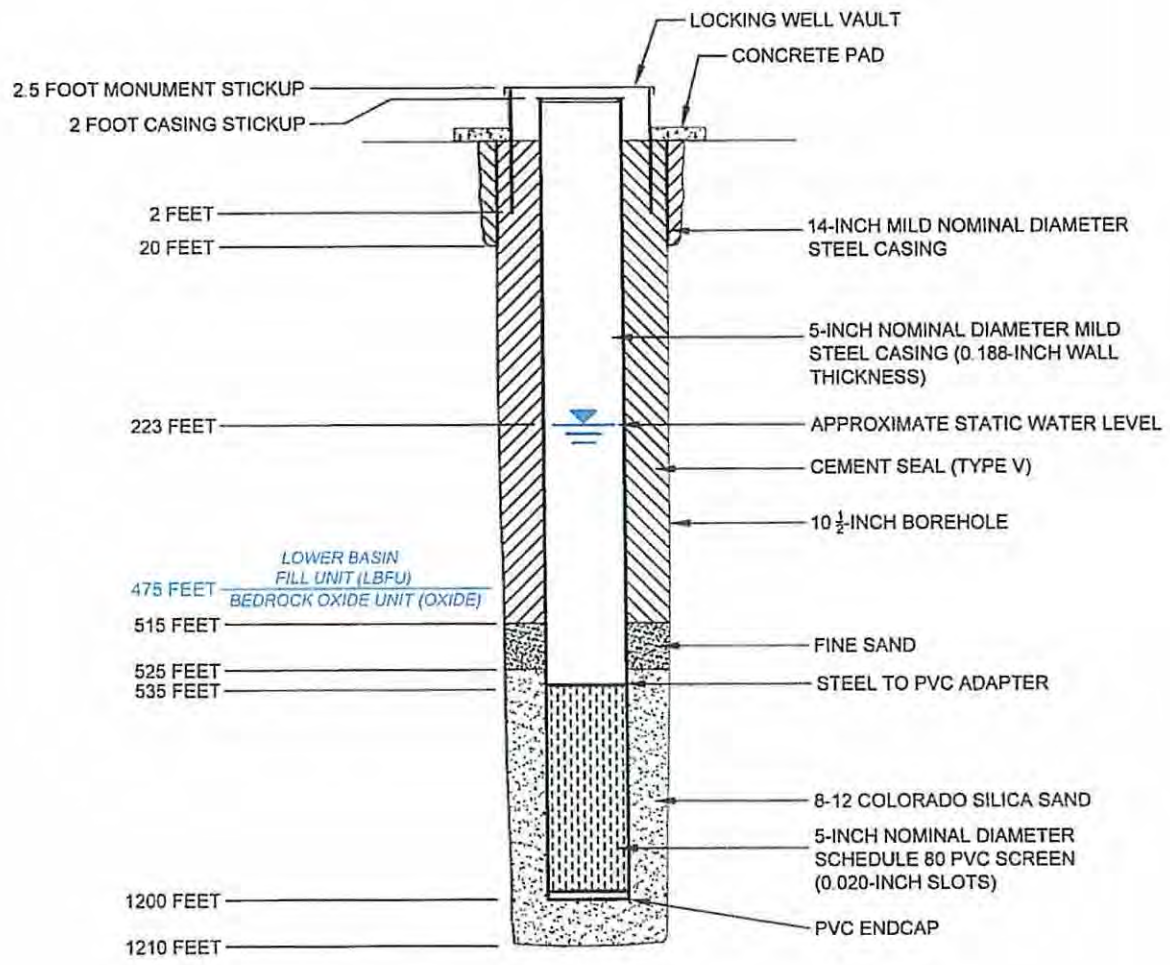
Land Owner		Well Owner (if different from Land Owner, See instructions)	
PRINT NAME AND TITLE		PRINT NAME AND TITLE	Ian Ream, Senior Hydrogeologist
SIGNATURE OF LAND OWNER		SIGNATURE OF WELL OWNER	
DATE		DATE	Jan 9, 2017
<input type="checkbox"/> By checking this box, you agree to allow ADWR to contact you via electronic mail.		<input checked="" type="checkbox"/> By checking this box, you agree to allow ADWR to contact you via electronic mail.	
EMAIL ADDRESS		EMAIL ADDRESS	IanReam@florencecopper.com

SECTION 5. Well Construction Diagram

Provide a well construction diagram showing all existing well construction features listed in Section 6 and Section 7.

See attached well diagram.

SS-226791



MOBIL, GITA
G:\PROJECTS\CURIS RESOURCES\30706-CURIS FEASIBILITY\DRAWINGS\M59-O_WELLDESIGN.DWG
Printed: 8/26/2015 2:12 PM Layout: M59-O

HALEY ALDRICH

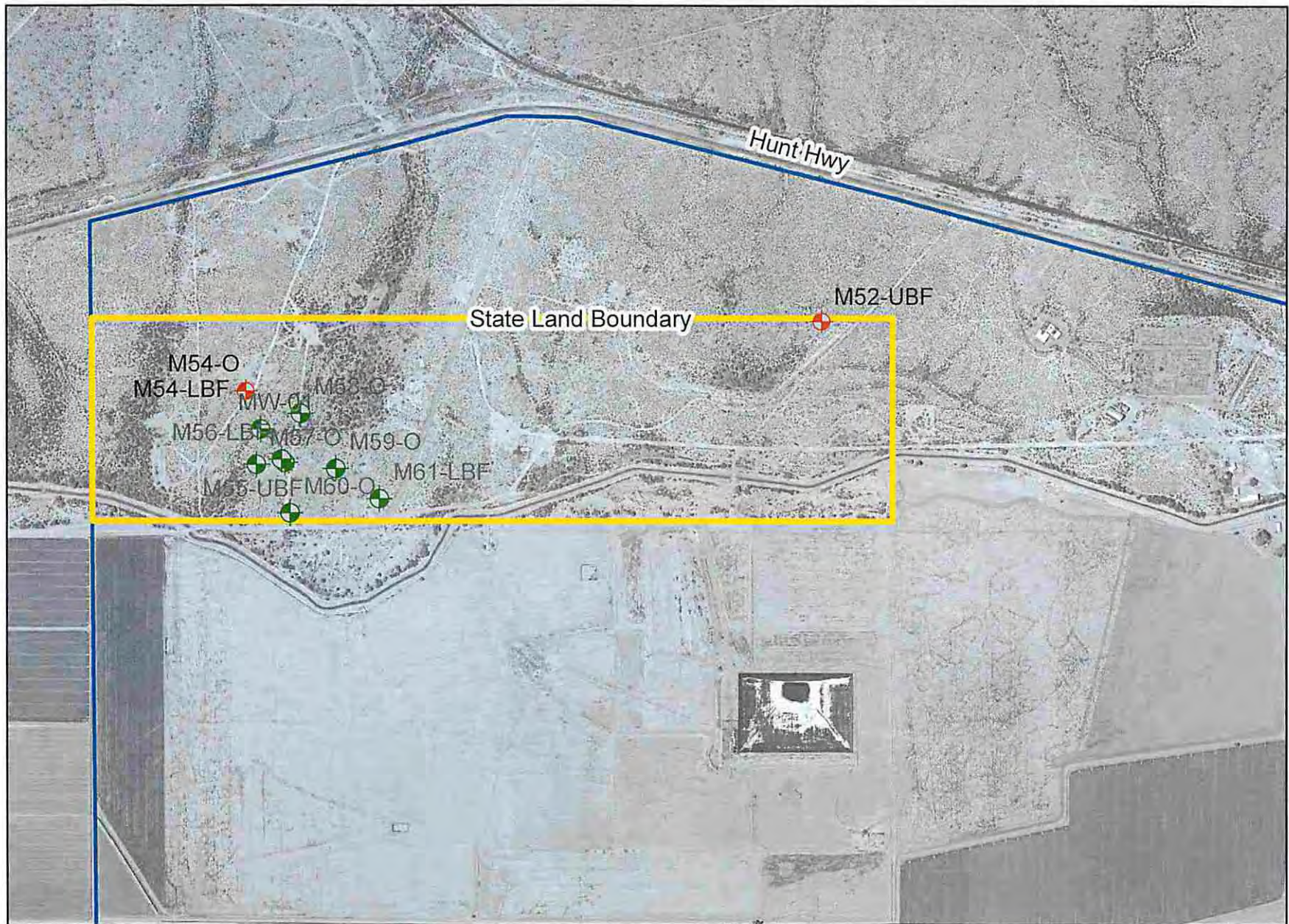
FLORENCE COPPER, INC
FLORENCE, ARIZONA

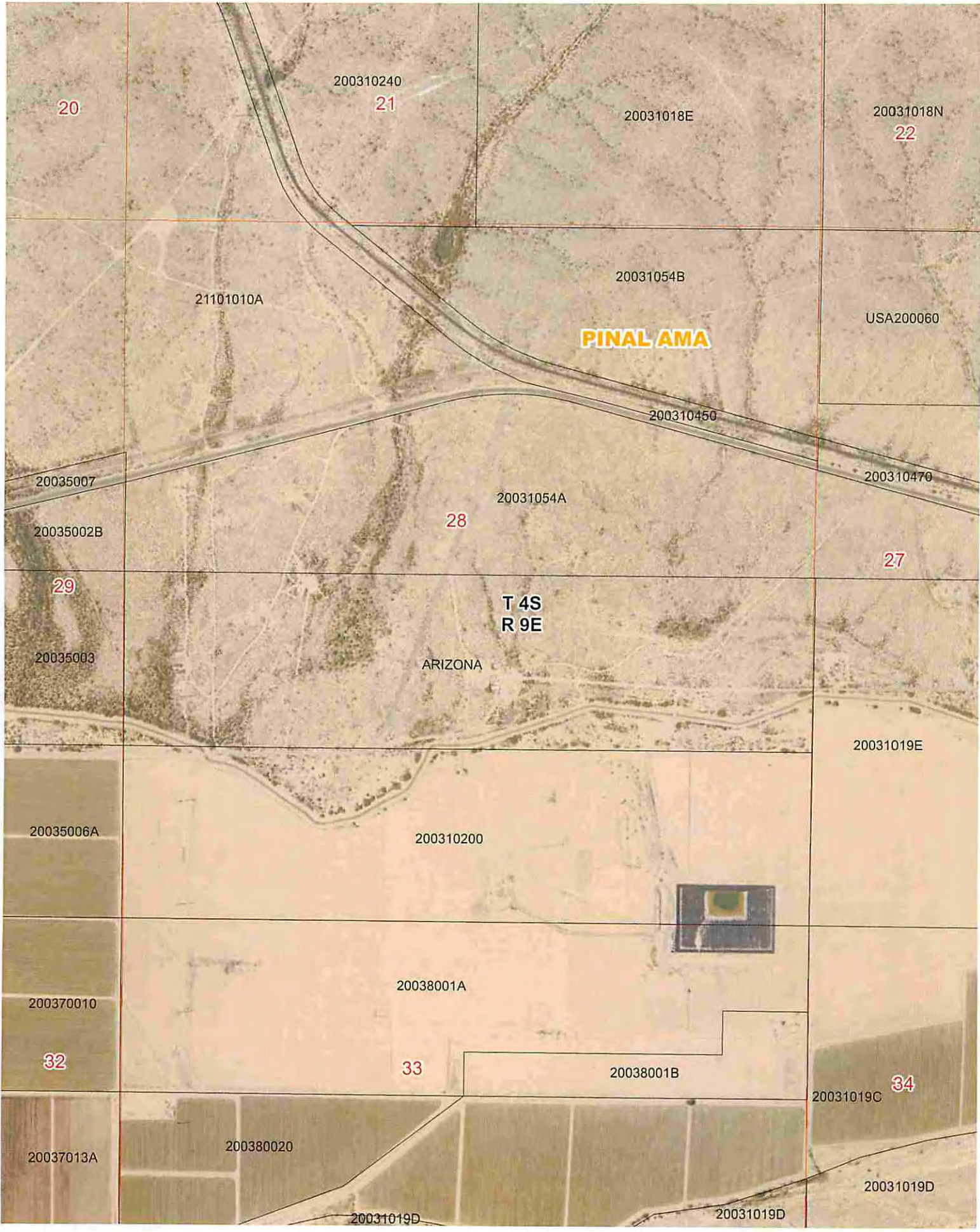
M59-O
WELL CONSTRUCTION DIAGRAM

FLORENCE COPPER INC

SCALE: NOT TO SCALE

FIGURE 1





Torren Valdez

From: Ian Ream <IanReam@florencecopper.com>
Sent: Friday, January 13, 2017 9:06 AM
To: Torren Valdez
Subject: Re: Map of monitor well locations

Hi Torren,

The pumps will be QED micro purge. They typically do a liter or two a minute. Very low flow. Looking for discreet interval samples. The flow rate is based on drawdown. The goal is not to draw down the well much more than a half a foot or 1 foot.

Thanks,

Ian Ream
Senior Hydrogeologist
Florence Copper

On Jan 13, 2017, at 8:56 AM, Torren Valdez <tvaldez@azwater.gov> wrote:

Ian,

Would you happen to know the pump capacity (gpm) for the low-flow pumps that will be installed on those monitoring wells?

Thank you,

Torren Valdez
Water Planning & Permitting Division
Arizona Department of Water Resources
602.771.8614

<image002.jpg>

From: Ian Ream [<mailto:IanReam@florencecopper.com>]
Sent: Thursday, January 12, 2017 11:13 AM
To: Torren Valdez <tvaldez@azwater.gov>
Subject: Map of monitor well locations

Hi Torren,

Here is a map with the well locations.

Please don't hesitate to contact me if you need anything else or have any questions.

Cheers,

Ian

Ian Ream Senior Hydrogeologist

<image003.jpg>

Florence Copper Inc.

1575 W. Hunt Highway Florence AZ USA 85132

C 520-840-9604 T 520-374-3984 F 520-374-3999

E ianream@florencecopper.com Web florencecopper.com

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NOTICE

A.R.S. § 41-1030(B), (D), (E) and (F) provide as follows:

B. An agency shall not base a licensing decision in whole or in part on a licensing requirement or condition that is not specifically authorized by statute, rule or state tribal gaming compact. A general grant of authority in statute does not constitute a basis for imposing a licensing requirement or condition unless a rule is made pursuant to that general grant of authority that specifically authorizes the requirement or condition.

D. This section may be enforced in a private civil action and relief may be awarded against the state. The court may award reasonable attorney fees, damages and all fees associated with the license application to a party that prevails in an action against the state for a violation of this section.

E. A state employee may not intentionally or knowingly violate this section. A violation of this section is cause for disciplinary action or dismissal pursuant to the agency's adopted personnel policy.

F. This section does not abrogate the immunity provided by section 12-820.01 or 12-820.02.

ARIZONA DEPARTMENT of WATER RESOURCES
1110 W. Washington St. Suite 310
Engineering and Permits Division
Phoenix, AZ 85007
602-771-8500

NOTICE TO WELL DRILLERS

This is a reminder that a valid drill card be present for the drilling of each and every well constructed on a site.* The problem seems to occur during the construction of a well when an unexpected problem occurs. Either the hole collapses, the hole is dry, a drill bit is lost and can't be recovered, or any number of other situations where the driller feels that he needs to move over and start another well. If you encounter this type of scenario, please be aware drillers do not have the authority to start another well without first obtaining drilling authority for the new well. Please note the following statutes and regulations pertaining to well drilling and construction:

ARIZONA REVISED STATUTE (A.R.S.)

A.R.S. § 45-592.A.

A person may construct, replace or deepen a well in this state only pursuant to this article and section 45-834.01. The drilling of a well may not begin until all requirements of this article and section 45-834.01, as applicable, are met.

A.R.S. § 594.A.

The director shall adopt rules establishing construction standards for new wells and replacement wells, the deepening and abandonment of existing wells and the capping of open wells.

A.R.S. § 600.A

A well driller shall maintain a complete and accurate log of each well drilled.

ARIZONA ADMINISTRATIVE CODE (A.A.C.)

A.A.C. R12-15-803.A.

A person shall not drill or abandon a well, or cause a well to be drilled or abandoned, in a manner which is not in compliance with A.R.S. Title 45, Chapter 2, Article 10, and the rules adopted thereunder.

A.A.C. R12-15-810.A.

A well drilling contractor or single well licensee may commence drilling a well only if the well drilling contractor or licensee has possession of a drilling card at the well site issued by the Director in the name of the well drilling contractor or licensee, authorizing the drilling of the specific well in the specific location.

A.A.C. R12-15-816.F.

In the course of drilling a new well, the well may be abandoned without first filing a notice of intent to abandon and without an abandonment card.

*** THIS REQUIREMENT DOES NOT PERTAIN TO THE DRILLING OF MINERAL EXPLORATION,
GEOTECHNICAL OR HEAT PUMP BOREHOLES**

Transaction Receipt - Success

Arizona Water Resources
Arizona Water Resources
MID:347501639533
1700 W Washington St
Phoenix , AZ 85012
602-771-8454

01/11/2017 04:20PM
Remittance ID
Arizona011117181536095Ald
Transaction ID:
178069995

KELSEY SHERRARD
500 Maint St
WOODLAND, California 95695
United States
Visa - 3420
Approval Code: 040691

Sale
Amount: \$1,800.00

55-226788, 55-226789, 55-226790, 55-226791, 55-226792, 55-226793, 55-226794, 55-226795, 55-226796, 55-226797, 55-226798, 55-226799

N/A

Cash Reciepts

0

palder@azwater.gov

Cardmember acknowledges
receipt of goods and/or
services in the amount of
the total shown hereon and
agrees to perform the
obligations set forth by the
cardmember's agreement with
the issuer.

Signature Phone Order
[click here](#) to continue.

Arizona Department of Water Resources

1110 West Washington Street, Suite 310

Phoenix AZ 85007

Customer:

KELSEY SHERRARD
500 MAIN STREET
WOODLAND, CA 95695

Receipt #: 17-49315
Office: MAIN OFFICE
Receipt Date: 01/11/2017
Sale Type: Mail
Cashier: WRPXA

Item No.	Function Code	AOBJ	Description	Ref ID	Qty	Unit Price	Ext Price
8505	122221	4439-6F	MONITOR, PIEZOMETER, AIR SPARGING, SOIL VAPOR EXTR		12	150.00	1,800.00
RECEIPT TOTAL:							1,800.00

Payment type: CREDIT CARD

Amount Paid: \$1,800.00

Authorization 178069995

Payment Received Date: 01/11/2017

Notes: Credit card payment for \$1,800.00 is for well registration numbers 55-226788, 55-226789, 55-226790, 55-226791, 55-226792, 55-226793, 55-226794, 55-226795, 55-226796, 55-226797, 55-226798, 55-226799

APPENDIX B

Lithologic Log

Oct 3, 17

H&A-SONIC-129687-ELEVATION HA-LIB09 WITH COMMENTS GLB HA-DIRECT PUSH + SONIC LOG GDT G:\PROJECTS\CURIS RESOURCES\129687 MONITOR WELL DRILLING\PROJECT DATA\GINT\GINT FILES\CI WELLS\CI WELLS.GPJ

HALEY ALDRICH				LITHOLOGIC LOG			M59-O	
Project Production Test Facility						Cadastral Location		
Client Florence Copper, Inc.						D (4-9) 28 CAC		
Contractor National EWP, Inc.								
Drilling Method		Conventional Mud Rotary		Concrete Pad		1478.55	feet, amsl	
Borehole Diameter(s)		10.625		Datum		State Plane NAD 83		
Rig Make & Model		Schramm T685WS		Location		N 746,232 E 848,009		
Start						March 21, 2017		
Finish						March 28, 2017		
H&A Rep.						C. Price		
Elevation (ft)	Depth (ft)	Well Diagram	USCS Symbol	Stratum Change Depth (ft)	LITHOLOGY IDENTIFICATION AND DESCRIPTION		COMMENTS	
1460	20		SP	15	POORLY GRADED SAND (0-15 feet) Primarily fine sand with ~5% fines and ~10% gravel to 25 mm. Sand is subangular to subrounded, gravel is subrounded to subangular. Fines are nonplastic, have low toughness, low dry strength, and are brown (7.5YR 5/3). UBFU		Well Registry ID: 55-226791 Surface Completion: Locking Well Vault & Concrete Pad Well casing stickup: 2.1 feet als COLOR IDENTIFICATION MADE WITH WET SAMPLES USING MUNSELL CHART	
1440	40		SW	30				
1420	60		GW	45				
1400	80		SP		WELL GRADED SAND (15-30 feet) Primarily fine to medium sand with ~5% fines and ~10% gravel to 25 mm. Sand and gravel is subrounded to subangular. Fines are nonplastic, have low toughness, low dry strength, and are brown (7.5YR 5/2). UBFU		Surface Casing: 14-inch mild steel; 0 - 40 feet Well Casing: Nominal 5-inch diameter Mild Steel; 0 - 534 feet	
1380	100		SP-SM	100	WELL GRADED GRAVEL with SAND (30-45 feet) Primarily gravel to 25mm with ~5% fines and 45% sand. Sand and gravel is subangular to subrounded. Fines are nonplastic, have low toughness, low dry strength, and are brown (7.5YR 5/2). UBFU			
1360	120		GP-GC	115				
1340	140		GP-GC	135	POORLY GRADED SAND with GRAVEL (45-100 feet) Primarily fine to coarse sand with ~10% fines and ~40% gravel to 25 mm. Sand and gravel is subangular to subrounded. Fines are nonplastic, have low toughness, low dry strength, and are brown (7.5YR 5/3). UBFU		Unit Intervals: UBFU: 0 - 285 feet MGFU: 285 - 305 feet LBFU: 305 - 465 feet Oxide: 465 - 1213 feet	
1320	160		SP-SM	160	POORLY GRADED SAND with SILT (100-115 feet) Primarily fine sand with ~10% fines and ~10% gravel to 6 mm. Sand and gravel is subangular to subrounded. Fines are nonplastic, have low toughness, low dry strength, and are brown (7.5YR 5/4). UBFU			
1300	180		GP					
1280	200				POORLY GRADED GRAVEL with SAND (115-135 feet) Primarily gravel to 51 mm with ~10% fines and ~40% sand. Sand is subrounded to subangular, gravel is rounded to subangular. Fines have low plasticity, low toughness, medium dry strength, and are light brown (7.5YR 6/3). UBFU		Seal: Type V neat cement; 0 - 512 feet Fine Sand & Bentonite; 512 - 524 feet	
1260	220		GC	285	POORLY GRADED SAND with SILT and GRAVEL (135-160 feet) Primarily fine sand with ~10% fines and ~10% gravel to 25 mm. Sand is subangular to subrounded, gravel is angular to subangular. Fines are nonplastic, have low toughness, low dry strength, and are brown (7.5YR 5/4). UBFU			
1240	240		SP	305				
1220	260		GW	320	POORLY GRADED GRAVEL with SAND (160-285 feet) Primarily gravel to 25 mm with ~5% fines and ~40% sand. Sand and gravel is subangular to subrounded. Fines are nonplastic, have low toughness, low dry strength, and are brown (7.5YR 5/4). UBFU		Filter Pack: 8 - 12 CO Silica Sand; 524 - 1213 feet Thread Adapter: Stainless Steel, SCH 80 F480 PVC to SCH 40 F480 Mild Steel; 534 feet Well Screen: Nominal 5-inch diameter, SCH 80 PVC Screen (0.020-inch slots); 534 - 1200 feet	
1200	280				CLAYEY GRAVEL with SAND (285-305 feet) Primarily gravel to 25 mm with ~15% fines and ~30% sand. Sand is subangular to subrounded, gravel is rounded to subangular. Fines have low plasticity, medium toughness, medium dry strength, and are reddish brown (5YR 5/4). MFGU Geologic description from lithlog over MFGU. Adjusted to reflect e-log for MFGU.			
1180	300		GP	400	POORLY GRADED SAND (305-320 feet) Primarily fine sand with ~5% fines and trace gravel to 6 mm. Sand is subrounded to subangular, gravel is rounded to subrounded. Fines are nonplastic, have low toughness, low dry strength, and are brown (7.5YR 5/3). LBFU Adjusted to reflect e-log for MFGU.			
1160	320				WELL GRADED GRAVEL with SAND (320-400 feet) Primarily gravel to 13 mm with ~5% fines and ~45% sand. Sand is subrounded to subangular, gravel is rounded to subangular. Fines are nonplastic, have low toughness, low dry strength, and are light brown (7.5YR 6/3). LBFU			
1140	340		GP	450				
1120	360			465	WELL GRADED GRAVEL with CLAY and SAND (400-450 feet) Primarily gravel to 13 mm with ~10% fines and ~35% sand. Sand is subrounded to subangular, gravel is rounded to subangular. Fines have low plasticity, low toughness, low dry strength, and are reddish yellow (7.5YR 6/6). LBFU			
1100	380				POORLY GRADED GRAVEL with SAND (450-465 feet) Primarily gravel to 6 mm with ~5% fines and ~45% sand. Sand is subangular to subrounded, gravel is angular to subrounded. Fines are nonplastic, have low toughness, low dry strength, and are light brown (7.5YR 6/3). LBFU Adjusted to reflect e-log for oxide contact. Field Lith log places contact at 485'.			
1080	400				QUARTZ MONZONITE (465-660 feet) Consists of quartz at approximately 35%, potassium feldspars at approximately 35%,			
1060	420							
1040	440							
1020	460							
1000	480							
980	500							
960	520							
940	540							
920	560							
900	580							
880	600							
NOTE: Lithologic descriptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).								
						Sheet No. 1 of 2		

NOTE: Lithologic descriptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).

Sheet No. 1 of 2

Elevation (ft)	Depth (ft)	Well Diagram	USCS Symbol	Stratum Change Depth (ft)	LITHOLOGY IDENTIFICATION AND DESCRIPTION	COMMENTS
600	600				plagioclase at approximately 25%, and biotite at approximately 5%. Cu minerals 535-660.	
620	620			660	GRANODIORITE (660-725 feet) Contains mostly plagioclase in a gray aphanitic matrix with biotite crystals composing approximately 10%. Cu minerals 660-670.	
640	640			725	QUARTZ MONZONITE (725-1110 feet) Consists of quartz at approximately 35%, potassium feldspars at approximately 35%, plagioclase at approximately 25%, and biotite at approximately 5%. Chrysocolla abundant 735-755. Clays increase 815-820, 860-865, 875-890	
660	660					
680	680					
700	700					
720	720					
740	740					
760	760					
780	780					
800	800					
820	820					
840	840					
860	860					
880	880					
900	900					
920	920					
940	940					
960	960					
980	980					
1000	1000					
1020	1020					
1040	1040					
1060	1060					
1080	1080					
1100	1100			1110	GRANODIORITE (1110-1170 feet) Contains mostly plagioclase in a gray aphanitic matrix with biotite crystals composing approximately 10%.	
1120	1120					
1140	1140			1170	QUARTZ MONZONITE (1170-1200 feet) Consists of quartz at approximately 35%, potassium feldspars at approximately 35%, plagioclase at approximately 25%, and biotite at approximately 5%. Cu minerals 1190-1195.	
1160	1160					
1180	1180			1200	GRANODIORITE (1200-1213 feet) Contains mostly plagioclase in a gray aphanitic matrix with biotite crystals composing approximately 10%.	
1200	1200			1213		
1213	1213					Total Depth: Driller Depth = 1213 feet; Geophysical Logging Depth = 1206 feet

NOTE: Lithologic descriptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).

APPENDIX C

Chemical Characterization of Formation Water



May 23, 2018

Barbara Sylvester
Brown & Caldwell
201 E. Washington Suite 500
Phoenix, AZ 85004

TEL (602) 567-3894
FAX -

Work Order No.: 18D0619
Order Name: Florence Copper

RE: PTF

Dear Barbara Sylvester,

Turner Laboratories, Inc. received 2 sample(s) on 04/25/2018 for the analyses presented in the following report.

All results are intended to be considered in their entirety, and Turner Laboratories, Inc. is not responsible for use of less than the complete report. Results apply only to the samples analyzed. Samples will be disposed of 30 days after issue of our report unless special arrangements are made.

The pages that follow may contain sensitive, privileged or confidential information intended solely for the addressee named above. If you receive this message and are not the agent or employee of the addressee, this communication has been sent in error. Please do not disseminate or copy any of the attached and notify the sender immediately by telephone. Please also return the attached sheet(s) to the sender by mail.

Please call if you have any questions.

Respectfully submitted,

Turner Laboratories, Inc.
ADHS License AZ0066

Kevin Brim
Project Manager

Client:

Project:

Work Order:

Date Received:

Brown & Caldwell

PTF

18D0619

04/25/2018

Order: Florence Copper

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date/Time
18D0619-01	R-09	Ground Water	04/23/2018 1555
18D0619-02	TB	Ground Water	04/25/2018 0000

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

Case Narrative

The 8015D analysis was performed by TestAmerica Laboratories, Inc. in Phoenix, AZ.

The radiochemistry analysis was performed by Radiation Safety Engineering, Inc. in Chandler, AZ.

D5 Minimum Reporting Limit (MRL) is adjusted due to sample dilution; analyte was non-detect in the sample.

H5 This test is specified to be performed in the field within 15 minutes of sampling; sample was received and analyzed past the regulatory holding time.

M3 The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The associated LCS/LCSD recovery was acceptable.

All soil, sludge, and solid matrix determinations are reported on a wet weight basis unless otherwise noted.

ND Not Detected at or above the PQL

PQL Practical Quantitation Limit

DF Dilution Factor

PRL Project Reporting Limit

Client: Brown & Caldwell

Project: PTF

Work Order: 18D0619

Lab Sample ID: 18D0619-01

Client Sample ID: R-09

Collection Date/Time: 04/23/2018 1555

Matrix: Ground Water

Order Name: Florence Copper

Analyses	Result	PRL	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
ICP Dissolved Metals-E 200.7 (4.4)									
Calcium	140		4.0	M3	mg/L	1	04/27/2018 1440	05/04/2018 1150	MH
Iron	ND		0.30		mg/L	1	04/27/2018 1440	05/04/2018 1150	MH
Magnesium	27		3.0		mg/L	1	04/27/2018 1440	05/04/2018 1150	MH
Potassium	6.8		5.0		mg/L	1	04/27/2018 1440	05/04/2018 1150	MH
Sodium	170		5.0	M3	mg/L	1	04/27/2018 1440	05/04/2018 1150	MH
ICP/MS Dissolved Metals-E 200.8 (5.4)									
Aluminum	ND		0.0800	D5	mg/L	2	04/27/2018 1440	05/07/2018 1139	MH
Antimony	ND		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Arsenic	0.0016		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Barium	0.071		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Beryllium	ND		0.00050	D5	mg/L	2	04/27/2018 1440	05/07/2018 1139	MH
Cadmium	ND		0.00025		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Chromium	0.0051		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Cobalt	ND		0.00025		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Copper	0.011		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Lead	ND		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Manganese	0.0020		0.00025		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Nickel	0.0033		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Selenium	ND		0.0025		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Thallium	ND		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Zinc	ND		0.040		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
CVAA Dissolved Mercury-E 245.1									
Mercury	ND		0.0010		mg/L	1	04/26/2018 0955	04/26/2018 1639	MH
pH-E150.1									
pH (pH Units)	7.8			H5	-	1	04/26/2018 1615	04/26/2018 1616	AP
Temperature (°C)	22			H5	-	1	04/26/2018 1615	04/26/2018 1616	AP
ICP/MS Total Metals-E200.8 (5.4)									
Uranium	0.016		0.00050		mg/L	1	04/27/2018 1230	04/30/2018 1348	MH

Client: Brown & Caldwell

Project: PTF

Work Order: 18D0619

Lab Sample ID: 18D0619-01

Client Sample ID: R-09

Collection Date/Time: 04/23/2018 1555

Matrix: Ground Water

Order Name: Florence Copper

Analyses	Result	PRL	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
Anions by Ion Chromatography-E300.0 (2.1)									
Chloride	310		25		mg/L	25	04/26/2018 1225	04/26/2018 1415	AP
Fluoride	ND		0.50		mg/L	1	04/25/2018 1208	04/25/2018 1544	AP
Nitrogen, Nitrate (As N)	8.8		0.50		mg/L	1	04/25/2018 1208	04/25/2018 1544	AP
Nitrogen, Nitrite (As N)	ND		0.10		mg/L	1	04/25/2018 1208	04/25/2018 1544	AP
Sulfate	190		130		mg/L	25	04/26/2018 1225	04/26/2018 1415	AP
Cyanide-E335.4									
Cyanide	ND		0.10		mg/L	1	04/26/2018 0845	04/30/2018 1545	AP
Alkalinity-SM2320B									
Alkalinity, Bicarbonate (As CaCO3)	150		2.0		mg/L	1	05/03/2018 1030	05/03/2018 1210	EJ
Alkalinity, Carbonate (As CaCO3)	ND		2.0		mg/L	1	05/03/2018 1030	05/03/2018 1210	EJ
Alkalinity, Hydroxide (As CaCO3)	ND		2.0		mg/L	1	05/03/2018 1030	05/03/2018 1210	EJ
Alkalinity, Phenolphthalein (As CaCO3)	ND		2.0		mg/L	1	05/03/2018 1030	05/03/2018 1210	EJ
Alkalinity, Total (As CaCO3)	150		2.0		mg/L	1	05/03/2018 1030	05/03/2018 1210	EJ
Specific Conductance-SM2510 B									
Conductivity	1700		0.20		µmhos/cm	2	05/09/2018 1315	05/09/2018 1330	AP
Total Dissolved Solids (Residue, Filterable)-SM2540 C									
Total Dissolved Solids (Residue, Filterable)	1000		20		mg/L	1	04/26/2018 0826	05/01/2018 1600	EJ
Volatile Organic Compounds by GC/MS-SW8260B									
Benzene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 1943	KP
Carbon disulfide	ND		2.0		ug/L	1	05/07/2018 1824	05/07/2018 1943	KP
Ethylbenzene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 1943	KP
Toluene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 1943	KP
Xylenes, Total	ND		1.5		ug/L	1	05/07/2018 1824	05/07/2018 1943	KP
Surr: 4-Bromofluorobenzene	95	70-130			%REC	1	05/07/2018 1824	05/07/2018 1943	KP
Surr: Dibromofluoromethane	101	70-130			%REC	1	05/07/2018 1824	05/07/2018 1943	KP
Surr: Toluene-d8	77	70-130			%REC	1	05/07/2018 1824	05/07/2018 1943	KP

Client:

Project:

Work Order:

Lab Sample ID:

Brown & Caldwell
PTF
18D0619
18D0619-02

Client Sample ID: TB

Collection Date/Time: 04/25/2018 0000

Matrix: Ground Water

Order Name: Florence Copper

Analyses	Result	PRL	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
Volatile Organic Compounds by GC/MS-SW8260B									
Benzene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 2344	KP
Carbon disulfide	ND		2.0		ug/L	1	05/07/2018 1824	05/07/2018 2344	KP
Ethylbenzene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 2344	KP
Toluene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 2344	KP
Xylenes, Total	ND		1.5		ug/L	1	05/07/2018 1824	05/07/2018 2344	KP
Surr: 4-Bromofluorobenzene	101	70-130			%REC	1	05/07/2018 1824	05/07/2018 2344	KP
Surr: Dibromofluoromethane	110	70-130			%REC	1	05/07/2018 1824	05/07/2018 2344	KP
Surr: Toluene-d8	103	70-130			%REC	1	05/07/2018 1824	05/07/2018 2344	KP

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1804269 - E 245.1										
Blank (1804269-BLK1)				Prepared & Analyzed: 04/26/2018						
Mercury	ND	0.0010	mg/L							
LCS (1804269-BS1)				Prepared & Analyzed: 04/26/2018						
Mercury	0.0049	0.0010	mg/L	0.005000		98	85-115			
LCS Dup (1804269-BSD1)				Prepared & Analyzed: 04/26/2018						
Mercury	0.0048	0.0010	mg/L	0.005000		95	85-115	2	20	
Matrix Spike (1804269-MS1)				Source: 18D0394-01		Prepared & Analyzed: 04/26/2018				
Mercury	0.0050	0.0010	mg/L	0.005000	0.00020	97	85-115			
Matrix Spike Dup (1804269-MSD1)				Source: 18D0394-01		Prepared & Analyzed: 04/26/2018				
Mercury	0.0050	0.0010	mg/L	0.005000	0.00020	96	85-115	1	20	
Batch 1804292 - E200.8 (5.4)										
Blank (1804292-BLK1)				Prepared & Analyzed: 04/30/2018						
Uranium	ND	0.00050	mg/L							
LCS (1804292-BS1)				Prepared & Analyzed: 04/30/2018						
Uranium	0.046	0.00050	mg/L	0.05000		92	85-115			
LCS Dup (1804292-BSD1)				Prepared & Analyzed: 04/30/2018						
Uranium	0.046	0.00050	mg/L	0.05000		92	85-115	0.2	20	
Matrix Spike (1804292-MS1)				Source: 18D0614-01		Prepared & Analyzed: 04/30/2018				
Uranium	0.051	0.00050	mg/L	0.05000	0.0015	99	70-130			
Batch 1805051 - E 200.7 (4.4)										
Blank (1805051-BLK1)				Prepared & Analyzed: 05/04/2018						
Calcium	ND	4.0	mg/L							
Iron	ND	0.30	mg/L							
Magnesium	ND	3.0	mg/L							
Potassium	ND	5.0	mg/L							
Sodium	ND	5.0	mg/L							
LCS (1805051-BS1)				Prepared & Analyzed: 05/04/2018						
Calcium	11	4.0	mg/L	10.00		109	85-115			
Iron	1.0	0.30	mg/L	1.000		104	85-115			
Magnesium	10	3.0	mg/L	10.00		105	85-115			
Potassium	10	5.0	mg/L	10.00		105	85-115			
Sodium	10	5.0	mg/L	10.00		105	85-115			
LCS Dup (1805051-BSD1)				Prepared & Analyzed: 05/04/2018						
Calcium	11	4.0	mg/L	10.00		110	85-115	1	20	
Iron	1.0	0.30	mg/L	1.000		105	85-115	0.5	20	
Magnesium	10	3.0	mg/L	10.00		105	85-115	0.06	20	
Potassium	10	5.0	mg/L	10.00		105	85-115	0.05	20	
Sodium	11	5.0	mg/L	10.00		109	85-115	4	20	

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1805051 - E 200.7 (4.4)										
Matrix Spike (1805051-MS1)		Source: 18D0619-01		Prepared & Analyzed: 05/04/2018						
Calcium	150	4.0	mg/L	10.00	140	59	70-130			M3
Iron	1.1	0.30	mg/L	1.000	0.028	105	70-130			
Magnesium	38	3.0	mg/L	10.00	27	108	70-130			
Potassium	17	5.0	mg/L	10.00	6.8	105	70-130			
Sodium	170	5.0	mg/L	10.00	170	30	70-130			M3
Matrix Spike (1805051-MS2)		Source: 18E0021-01		Prepared & Analyzed: 05/04/2018						
Calcium	64	4.0	mg/L	10.00	54	103	70-130			
Iron	1.0	0.30	mg/L	1.000	0.0060	101	70-130			
Magnesium	21	3.0	mg/L	10.00	11	99	70-130			
Potassium	15	5.0	mg/L	10.00	4.7	104	70-130			
Sodium	99	5.0	mg/L	10.00	90	87	70-130			
Batch 1805069 - E 200.8 (5.4)										
Blank (1805069-BLK1)		Prepared & Analyzed: 05/07/2018								
Aluminum	ND	0.0400	mg/L							
Antimony	ND	0.00050	mg/L							
Arsenic	ND	0.00050	mg/L							
Barium	ND	0.00050	mg/L							
Beryllium	ND	0.00025	mg/L							
Cadmium	ND	0.00025	mg/L							
Chromium	ND	0.00050	mg/L							
Cobalt	ND	0.00025	mg/L							
Copper	ND	0.00050	mg/L							
Lead	ND	0.00050	mg/L							
Manganese	ND	0.00025	mg/L							
Nickel	ND	0.00050	mg/L							
Selenium	ND	0.0025	mg/L							
Thallium	ND	0.00050	mg/L							
Zinc	ND	0.040	mg/L							
LCS (1805069-BS1)		Prepared & Analyzed: 05/07/2018								
Aluminum	0.104	0.0400	mg/L	0.1000		104	85-115			
Antimony	0.048	0.00050	mg/L	0.05000		96	85-115			
Arsenic	0.050	0.00050	mg/L	0.05000		100	85-115			
Barium	0.050	0.00050	mg/L	0.05000		100	85-115			
Beryllium	0.049	0.00025	mg/L	0.05000		97	85-115			
Cadmium	0.050	0.00025	mg/L	0.05000		100	85-115			
Chromium	0.051	0.00050	mg/L	0.05000		102	85-115			
Cobalt	0.051	0.00025	mg/L	0.05000		101	85-115			
Copper	0.051	0.00050	mg/L	0.05000		103	85-115			
Lead	0.049	0.00050	mg/L	0.05000		98	85-115			
Manganese	0.050	0.00025	mg/L	0.05000		101	85-115			
Nickel	0.051	0.00050	mg/L	0.05000		102	85-115			
Selenium	0.051	0.0025	mg/L	0.05000		103	85-115			
Thallium	0.050	0.00050	mg/L	0.05000		101	85-115			
Zinc	0.10	0.040	mg/L	0.1000		101	85-115			

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1805069 - E 200.8 (5.4)										
LCS Dup (1805069-BSD1)				Prepared & Analyzed: 05/07/2018						
Aluminum	0.115	0.0400	mg/L	0.1000		115	85-115	10	20	
Antimony	0.048	0.00050	mg/L	0.05000		96	85-115	0.7	20	
Arsenic	0.050	0.00050	mg/L	0.05000		101	85-115	0.8	20	
Barium	0.051	0.00050	mg/L	0.05000		102	85-115	1	20	
Beryllium	0.049	0.00025	mg/L	0.05000		97	85-115	0.2	20	
Cadmium	0.050	0.00025	mg/L	0.05000		100	85-115	0.2	20	
Chromium	0.051	0.00050	mg/L	0.05000		102	85-115	0.4	20	
Cobalt	0.050	0.00025	mg/L	0.05000		101	85-115	0.5	20	
Copper	0.052	0.00050	mg/L	0.05000		105	85-115	2	20	
Lead	0.049	0.00050	mg/L	0.05000		98	85-115	0.1	20	
Manganese	0.050	0.00025	mg/L	0.05000		101	85-115	0.09	20	
Nickel	0.051	0.00050	mg/L	0.05000		103	85-115	0.8	20	
Selenium	0.052	0.0025	mg/L	0.05000		104	85-115	2	20	
Thallium	0.050	0.00050	mg/L	0.05000		101	85-115	0.06	20	
Zinc	0.10	0.040	mg/L	0.1000		104	85-115	3	20	
Matrix Spike (1805069-MS1)				Source: 18D0693-01		Prepared & Analyzed: 05/07/2018				
Aluminum	0.239	0.0400	mg/L	0.1000	0.166	74	70-130			
Antimony	0.045	0.00050	mg/L	0.05000	0.00024	90	70-130			
Arsenic	0.056	0.00050	mg/L	0.05000	0.0035	104	70-130			
Barium	0.16	0.00050	mg/L	0.05000	0.12	94	70-130			
Beryllium	0.045	0.00025	mg/L	0.05000	0.000029	90	70-130			
Cadmium	0.047	0.00025	mg/L	0.05000	ND	94	70-130			
Chromium	0.049	0.00050	mg/L	0.05000	0.00052	98	70-130			
Cobalt	0.048	0.00025	mg/L	0.05000	0.00097	95	70-130			
Copper	0.051	0.00050	mg/L	0.05000	0.0020	98	70-130			
Lead	0.047	0.00050	mg/L	0.05000	0.00016	94	70-130			
Manganese	0.054	0.00025	mg/L	0.05000	0.0075	94	70-130			
Nickel	0.049	0.00050	mg/L	0.05000	0.0018	94	70-130			
Selenium	0.057	0.0025	mg/L	0.05000	ND	114	70-130			
Thallium	0.048	0.00050	mg/L	0.05000	0.000038	96	70-130			
Zinc	0.11	0.040	mg/L	0.1000	ND	109	70-130			

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1804261 - SM2540 C										
Duplicate (1804261-DUP1)		Source: 18D0606-01		Prepared: 04/26/2018 Analyzed: 04/27/2018						
Total Dissolved Solids (Residue, Filterable)	630	20	mg/L		630			0.3	5	
Duplicate (1804261-DUP2)		Source: 18D0606-02		Prepared: 04/26/2018 Analyzed: 04/27/2018						
Total Dissolved Solids (Residue, Filterable)	610	20	mg/L		620			0.8	5	
Batch 1804268 - E335.4										
Blank (1804268-BLK1)		Prepared: 04/26/2018 Analyzed: 04/30/2018								
Cyanide	ND	0.10	mg/L							
LCS (1804268-BS1)		Prepared: 04/26/2018 Analyzed: 04/30/2018								
Cyanide	2.0	0.10	mg/L	2.000		101	90-110			
LCS Dup (1804268-BSD1)		Prepared: 04/26/2018 Analyzed: 04/30/2018								
Cyanide	2.0	0.10	mg/L	2.000		101	90-110	0.1	20	
Matrix Spike (1804268-MS1)		Source: 18D0602-03		Prepared: 04/26/2018 Analyzed: 04/30/2018						
Cyanide	2.1	0.10	mg/L	2.000	ND	103	90-110			
Matrix Spike Dup (1804268-MSD1)		Source: 18D0602-03		Prepared: 04/26/2018 Analyzed: 04/30/2018						
Cyanide	2.0	0.10	mg/L	2.000	ND	98	90-110	5	20	
Batch 1804272 - E150.1										
Duplicate (1804272-DUP1)		Source: 18D0662-02		Prepared & Analyzed: 04/26/2018						
pH (pH Units)	7.8		-		7.8			0.1	200	H5
Temperature (°C)	21		-		21			2	200	H5
Batch 1805027 - SM2320B										
LCS (1805027-BS1)		Prepared & Analyzed: 05/03/2018								
Alkalinity, Total (As CaCO3)	240	2.0	mg/L	250.0		96	90-110			
LCS Dup (1805027-BSD1)		Prepared & Analyzed: 05/03/2018								
Alkalinity, Total (As CaCO3)	240	2.0	mg/L	250.0		96	90-110	0	10	
Matrix Spike (1805027-MS1)		Source: 18D0606-02		Prepared & Analyzed: 05/03/2018						
Alkalinity, Total (As CaCO3)	370	2.0	mg/L	250.0	130	96	85-115			
Matrix Spike Dup (1805027-MSD1)		Source: 18D0606-02		Prepared & Analyzed: 05/03/2018						
Alkalinity, Total (As CaCO3)	370	2.0	mg/L	250.0	130	95	85-115	0.5	10	
Batch 1805103 - SM2510 B										
LCS (1805103-BS1)		Prepared & Analyzed: 05/09/2018								
Conductivity	140	0.10	µmhos/cm	141.2		101	0-200			
LCS Dup (1805103-BSD1)		Prepared & Analyzed: 05/09/2018								
Conductivity	140	0.10	µmhos/cm	141.2		101	0-200	0.7	200	
Duplicate (1805103-DUP1)		Source: 18E0192-01		Prepared & Analyzed: 05/09/2018						
Conductivity	4.0	0.10	µmhos/cm		4.0			0	10	

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

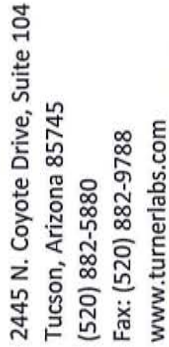
QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1805074 - SW8260B										
Blank (1805074-BLK1)				Prepared & Analyzed: 05/07/2018						
Benzene	ND	0.50	ug/L							
Carbon disulfide	ND	2.0	ug/L							
Ethylbenzene	ND	0.50	ug/L							
Toluene	ND	0.50	ug/L							
Xylenes, Total	ND	1.5	ug/L							
Surrogate: 4-Bromofluorobenzene	25.0		ug/L	25.00		100	70-130			
Surrogate: Dibromofluoromethane	26.9		ug/L	25.00		107	70-130			
Surrogate: Toluene-d8	25.1		ug/L	25.00		100	70-130			
LCS (1805074-BS1)				Prepared & Analyzed: 05/07/2018						
1,1-Dichloroethene	29		ug/L	25.00		114	70-130			
Benzene	27		ug/L	25.00		109	70-130			
Chlorobenzene	29		ug/L	25.00		115	70-130			
Toluene	25		ug/L	25.00		101	70-130			
Trichloroethene	26		ug/L	25.00		103	70-130			
Surrogate: 4-Bromofluorobenzene	24.6		ug/L	25.00		98	70-130			
Surrogate: Dibromofluoromethane	25.6		ug/L	25.00		102	70-130			
Surrogate: Toluene-d8	24.8		ug/L	25.00		99	70-130			
LCS Dup (1805074-BSD1)				Prepared & Analyzed: 05/07/2018						
1,1-Dichloroethene	27		ug/L	25.00		110	70-130	4	30	
Benzene	26		ug/L	25.00		104	70-130	5	30	
Chlorobenzene	26		ug/L	25.00		105	70-130	9	30	
Toluene	24		ug/L	25.00		96	70-130	5	30	
Trichloroethene	25		ug/L	25.00		98	70-130	4	30	
Surrogate: 4-Bromofluorobenzene	24.4		ug/L	25.00		98	70-130			
Surrogate: Dibromofluoromethane	26.1		ug/L	25.00		104	70-130			
Surrogate: Toluene-d8	25.1		ug/L	25.00		100	70-130			
Matrix Spike (1805074-MS1)				Source: 18D0582-02	Prepared & Analyzed: 05/07/2018					
1,1-Dichloroethene	27		ug/L	25.00	0.070	109	70-130			
Benzene	26		ug/L	25.00	0.020	104	70-130			
Chlorobenzene	26		ug/L	25.00	0.0	105	70-130			
Toluene	27		ug/L	25.00	3.5	95	70-130			
Trichloroethene	24		ug/L	25.00	0.040	97	70-130			
Surrogate: 4-Bromofluorobenzene	24.4		ug/L	25.00		98	70-130			
Surrogate: Dibromofluoromethane	26.4		ug/L	25.00		106	70-130			
Surrogate: Toluene-d8	24.9		ug/L	25.00		100	70-130			
Matrix Spike Dup (1805074-MSD1)				Source: 18D0582-02	Prepared & Analyzed: 05/07/2018					
1,1-Dichloroethene	27		ug/L	25.00	0.070	108	70-130	0.8	30	
Benzene	25		ug/L	25.00	0.020	101	70-130	2	30	
Chlorobenzene	26		ug/L	25.00	0.0	105	70-130	0.3	30	
Toluene	27		ug/L	25.00	3.5	95	70-130	0.1	30	
Trichloroethene	24		ug/L	25.00	0.040	95	70-130	2	30	
Surrogate: 4-Bromofluorobenzene	24.7		ug/L	25.00		99	70-130			
Surrogate: Dibromofluoromethane	26.4		ug/L	25.00		106	70-130			
Surrogate: Toluene-d8	25.3		ug/L	25.00		101	70-130			

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1804245 - E300.0 (2.1)										
Blank (1804245-BLK1)				Prepared & Analyzed: 04/25/2018						
Chloride	ND	1.0	mg/L							
Fluoride	ND	0.50	mg/L							
Nitrogen, Nitrate (As N)	ND	0.50	mg/L							
Nitrogen, Nitrite (As N)	ND	0.10	mg/L							
Sulfate	ND	5.0	mg/L							
LCS (1804245-BS1)				Prepared & Analyzed: 04/25/2018						
Chloride	12	1.0	mg/L	12.50		92	90-110			
Fluoride	2.0	0.50	mg/L	2.000		101	90-110			
Nitrogen, Nitrate (As N)	4.7	0.50	mg/L	5.000		95	90-110			
Nitrogen, Nitrite (As N)	2.3	0.10	mg/L	2.500		92	90-110			
Sulfate	12	5.0	mg/L	12.50		96	90-110			
LCS Dup (1804245-BSD1)				Prepared & Analyzed: 04/25/2018						
Chloride	12	1.0	mg/L	12.50		94	90-110	2	10	
Fluoride	2.0	0.50	mg/L	2.000		101	90-110	0.4	10	
Nitrogen, Nitrate (As N)	4.9	0.50	mg/L	5.000		98	90-110	3	10	
Nitrogen, Nitrite (As N)	2.4	0.10	mg/L	2.500		95	90-110	3	10	
Sulfate	12	5.0	mg/L	12.50		98	90-110	3	10	
Matrix Spike (1804245-MS1)		Source: 18D0613-08		Prepared & Analyzed: 04/25/2018						
Fluoride	3.7	0.50	mg/L	2.000	1.7	100	80-120			
Nitrogen, Nitrate (As N)	4.7	0.50	mg/L	5.000	0.22	89	80-120			
Matrix Spike (1804245-MS2)		Source: 18D0625-01		Prepared & Analyzed: 04/26/2018						
Nitrogen, Nitrate (As N)	5.0	0.50	mg/L	5.000	0.46	92	80-120			
Nitrogen, Nitrite (As N)	2.2	0.10	mg/L	2.500	ND	88	80-120			
Matrix Spike (1804245-MS3)		Source: 18D0614-01RE1		Prepared & Analyzed: 04/26/2018						
Chloride	17		mg/L	12.50	6.4	88	80-120			
Sulfate	28		mg/L	12.50	18	85	80-120			
Matrix Spike Dup (1804245-MSD1)		Source: 18D0613-08		Prepared & Analyzed: 04/25/2018						
Fluoride	3.7	0.50	mg/L	2.000	1.7	100	80-120	0.4	10	
Nitrogen, Nitrate (As N)	4.7	0.50	mg/L	5.000	0.22	90	80-120	0.6	10	
Matrix Spike Dup (1804245-MSD2)		Source: 18D0625-01		Prepared & Analyzed: 04/26/2018						
Nitrogen, Nitrate (As N)	5.1	0.50	mg/L	5.000	0.46	92	80-120	0.2	10	
Nitrogen, Nitrite (As N)	2.2	0.10	mg/L	2.500	ND	88	80-120	0.4	10	
Matrix Spike Dup (1804245-MSD3)		Source: 18D0614-01RE1		Prepared & Analyzed: 04/26/2018						
Chloride	18		mg/L	12.50	6.4	89	80-120	0.6	10	
Sulfate	29		mg/L	12.50	18	86	80-120	0.6	10	



TURNER WORK ORDER # 18D0619 DATE 4/23/18 PAGE 1 OF 1

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ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Phoenix

4625 East Cotton Ctr Blvd

Suite 189

Phoenix, AZ 85040

Tel: (602)437-3340

TestAmerica Job ID: 550-101943-1

Client Project/Site: 18D0619

For:

Turner Laboratories, Inc.

2445 North Coyote Drive

Suite 104

Tucson, Arizona 85745

Attn: Kevin Brim



Authorized for release by:

5/16/2018 12:23:25 PM

Ken Baker, Project Manager II

(602)659-7624

ken.baker@testamericainc.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
Q9	Insufficient sample received to meet method QC requirements.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Job ID: 550-101943-1

Laboratory: TestAmerica Phoenix

Narrative

Job Narrative
550-101943-1

Comments

No additional comments.

Receipt

The sample was received on 4/27/2018 10:50 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.8° C.

GC Semi VOA

Method(s) 8015D: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD) associated with preparation batch 550-145985 and analytical batch 550-146884. Affected samples have been added a Q9 qualifier. 18D0619-01 (550-101943-1)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep

Method(s) 3510C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with 3510C.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Sample Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
550-101943-1	18D0619-01	Water	04/23/18 15:55	04/27/18 10:50

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

Detection Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Client Sample ID: 18D0619-01

Lab Sample ID: 550-101943-1

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
ORO (C22-C32)	0.21	Q9	0.20	mg/L	1		8015D	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Client Sample ID: 18D0619-01

Date Collected: 04/23/18 15:55

Date Received: 04/27/18 10:50

Lab Sample ID: 550-101943-1

Matrix: Water

Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
ORO (C22-C32)	0.21	Q9	0.20	mg/L		04/30/18 14:16	05/10/18 23:29	1
DRO (C10-C22)	ND	Q9	0.10	mg/L		04/30/18 14:16	05/10/18 23:29	1
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac
o-Terphenyl (Surr)	79		10 - 150			04/30/18 14:16	05/10/18 23:29	1

Surrogate Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Method: 8015D - Diesel Range Organics (DRO) (GC)

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)		
Lab Sample ID	Client Sample ID	OTPH (10-150)
550-101943-1	18D0619-01	79
LCS 550-145985/2-A	Lab Control Sample	79
LCSD 550-145985/3-A	Lab Control Sample Dup	79
MB 550-145985/1-A	Method Blank	65
Surrogate Legend		
OTPH = o-Terphenyl (Surr)		

QC Sample Results

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Method: 8015D - Diesel Range Organics (DRO) (GC)

Lab Sample ID: MB 550-145985/1-A

Matrix: Water

Analysis Batch: 146884

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 145985

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
ORO (C22-C32)	ND		0.20	mg/L		04/30/18 14:15	05/11/18 11:16	1
DRO (C10-C22)	ND		0.10	mg/L		04/30/18 14:15	05/11/18 11:16	1
Surrogate	MB %Recovery	MB Qualifier	Limits			Prepared	Analyzed	Dil Fac
o-Terphenyl (Surr)	65		10 - 150			04/30/18 14:15	05/11/18 11:16	1

Lab Sample ID: LCS 550-145985/2-A

Matrix: Water

Analysis Batch: 146884

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 145985

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
ORO (C22-C32)	1.60	1.59		mg/L		99	69 - 107
DRO (C10-C22)	0.400	0.450		mg/L		113	42 - 133
Surrogate	LCS %Recovery	LCS Qualifier	Limits				
o-Terphenyl (Surr)	79		10 - 150				

Lab Sample ID: LCSD 550-145985/3-A

Matrix: Water

Analysis Batch: 146884

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 145985

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
ORO (C22-C32)	1.60	1.59		mg/L		100	69 - 107	0	20
DRO (C10-C22)	0.400	0.447		mg/L		112	42 - 133	1	22
Surrogate	LCSD %Recovery	LCSD Qualifier	Limits						
o-Terphenyl (Surr)	79		10 - 150						

TestAmerica Phoenix

QC Association Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

GC Semi VOA

Prep Batch: 145985

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-101943-1	18D0619-01	Total/NA	Water	3510C	
MB 550-145985/1-A	Method Blank	Total/NA	Water	3510C	
LCS 550-145985/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 550-145985/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Analysis Batch: 146884

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-101943-1	18D0619-01	Total/NA	Water	8015D	145985
MB 550-145985/1-A	Method Blank	Total/NA	Water	8015D	145985
LCS 550-145985/2-A	Lab Control Sample	Total/NA	Water	8015D	145985
LCSD 550-145985/3-A	Lab Control Sample Dup	Total/NA	Water	8015D	145985

Lab Chronicle

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Client Sample ID: 18D0619-01
Date Collected: 04/23/18 15:55
Date Received: 04/27/18 10:50

Lab Sample ID: 550-101943-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			145985	04/30/18 14:16	REM	TAL PHX
Total/NA	Analysis	8015D		1	146884	05/10/18 23:29	TC1	TAL PHX

Laboratory References:
TAL PHX = TestAmerica Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

Accreditation/Certification Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Laboratory: TestAmerica Phoenix

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
Arizona	State Program	9	AZ0728	06-09-18
Analysis Method	Prep Method	Matrix	Analyte	

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

Method Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Method	Method Description	Protocol	Laboratory
8015D	Diesel Range Organics (DRO) (GC)	SW846	TAL PHX
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	TAL PHX

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL PHX = TestAmerica Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

SUBCONTRACT ORDER

Turner Laboratories, Inc.

18D0619

101943

SENDING LABORATORY:

Turner Laboratories, Inc.
2445 N. Coyote Drive, Ste #104
Tucson, AZ 85745
Phone: 520.882.5880
Fax: 520.882.9788
Project Manager: Kevin Brim

RECEIVING LABORATORY:

TestAmerica Phoenix
4625 East Cotton Center Boulevard Suite 189
Phoenix, AZ 85540
Phone : (602) 437-3340
Fax:
Please CC Kevin Brim Kbrim@turnerlabs.com

Analysis

Expires

Laboratory ID

Comments

Sample ID: 18D0619-01 Drinking Water Sampled: 04/23/2018 15:55

8015D Sub

04/30/2018 15:55

8015D DRO and ORO Paramaters Only

Containers Supplied:

8015D Sub

o-Terphenyl
C10-C32 (Total)
C22-C32 (Oil Range Organics)
C10-C22 (Diesel Range Organics)
C6-C10 (Gasoline Range Organics)

550-101943 Chain of Custody



TA-PHX

3.8 L
LPS
GVR

Released By

Date

Received By

Date

Released By

Date

Received By

Date

Login Sample Receipt Checklist

Client: Turner Laboratories, Inc.

Job Number: 550-101943-1

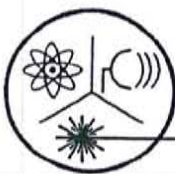
Login Number: 101943

List Source: TestAmerica Phoenix

List Number: 1

Creator: Gravlin, Andrea

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	False	Check done at department level as required.



Radiation Safety Engineering, Inc.

3245 N. WASHINGTON ST. • CHANDLER, ARIZONA 85225-1121

Website: www.radsafe.com

(480) 897-9459

FAX (480) 892-5446

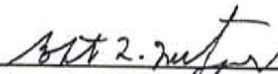
Radiochemical Activity in Water (pCi/L)

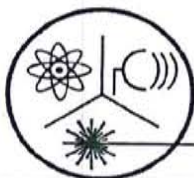
Turner Laboratories
2445 N. Coyote Drive, Ste. 104
Tucson, AZ 85745

Sampling Date: April 23, 2018
Sample Received: May 01, 2018
Analysis Completed: May 22, 2018

Sample ID	Gross Alpha Activity Method 600/00-02 (pCi/L)	Uranium Activity Method ASTM D6239 (pCi/L)	Adjusted Gross Alpha (pCi/L)	Radium 226 Activity Method GammaRay HPGE (pCi/L)	Radium 228 Activity Method GammaRay HPGE (pCi/L)	Total Radium (pCi/L)
18D0619-01	17.7 ± 0.9	12.9 ± 1.2	4.8 ± 1.5	3.1 ± 0.3	3.1 ± 0.4	6.2 ± 0.5

Date of Analysis	5/2/2018	5/21/2018	5/21/2018	5/4/2018	5/4/2018	5/4/2018
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 Robert L. Metzger, Ph.D., C.H.P. 5/22/2018
 Laboratory License Number AZ0462 Date



Radiation Safety Engineering, Inc.

3245 N. WASHINGTON ST. • CHANDLER, ARIZONA 85225-1121

Website: www.radsafe.com

(480) 897-9459

FAX (480) 892-5446

Isotopic Uranium Analysis

Turner Laboratories
2445 N. Coyote Drive, Ste. 104
Tucson, AZ 85745

Sampling Date: April 23, 2018

Sample Received: May 01, 2018

Uranium Analysis Date: May 21, 2018

Sample No.	^{238}U	^{235}U	^{234}U	Total	
18D0619-01	6.0 ± 0.6	0.280 ± 0.004	6.6 ± 0.6	12.9 ± 1.2	Activity (pCi/L)
	17.9 ± 1.7	0.131 ± 0.002	0.00106 ± 0.00010	18.0 ± 1.7	Content ($\mu\text{g/L}$)
	Comments:				

Robert L. Metzger
Robert L. Metzger, Ph.D., C.H.P.

5/22/2018

Date

Laboratory License Number AZ0462

Arizona Department of Environmental Quality
Drinking Water Radionuclides-Adjusted Gross Alpha, Radium 226 & 228, Uranium Analysis Report
 Samples To Be Taken At Entry Point Into Distribution System (EPDS) Only

PWS ID#: AZ04

PWS Name: _____

April 23, 2018 15:55 (24 hour clock)

Sample Date

Sample Time

Owner/Contact Person

Owner/Contact Fax Number

Owner/Contact Phone Number

Sample Collection Point

☐ EPDS # _____**Compliance Sample Type:**☐

Reduced Monitoring

Date Q1 collected: _____

☐

Quarterly

Date Q2 collected: _____

☐

Composite of four quarterly samples

Date Q3 collected: _____

Date Q4 collected: _____

*****RADIOCHEMICAL ANALYSIS*****

>>>To be filled out by laboratory personnel<<<

*****Combined Uranium must be reported in micrograms per liter*****

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analyses Run Date	Result	Exceed MCL
	15 pCi/L		Adjusted Gross Alpha	4000	5/21/2018	4.8 ± 1.5	
600/00-02		3 pCi/L	Gross Alpha	4002	5/2/2018	17.7 ± 0.9	
7500 - Rn			Radon	4004			
ASTM D6239	30 µg/L	1 µg/L	Combined Uranium	4006	5/21/2018	18.0 ± 1.7 µg/L	
			Uranium 234	4007	5/21/2018	0.00106 ± 0.00010	
			Uranium 235	4008	5/21/2018	0.131 ± 0.002	
			Uranium 238	4009	5/21/2018	17.9 ± 1.7	
	5 pCi/L	1 pCi/L	Combined Radium (226,228)	4010	5/4/2018	6.2 ± 0.5	X
GammaRay HPGE		1 pCi/L	Radium 226	4020	5/4/2018	3.1 ± 0.3	
GammaRay HPGE		1 pCi/L	Radium 228	4030	5/4/2018	3.1 ± 0.4	

*****LABORATORY INFORMATION*****

>>>To be filled out by laboratory personnel<<<

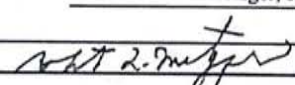
Specimen Number: RSE60312

Lab ID Number: AZ0462

Lab Name: Radiation Safety Engineering, Inc.

Printed Name and Phone Number of Laboratory Contact: Robert L. Metzger, Ph.D., C.H.P. (480) 897-9459

Comments: 18D0619-01

Authorized Signature: 

Date Public Water System Notified: _____

DWAR 6: 11/2007

SUBCONTRACT ORDER

Turner Laboratories, Inc.

18D0619

SENDING LABORATORY:

Turner Laboratories, Inc.
2445 N. Coyote Drive, Ste #104
Tucson, AZ 85745
Phone: 520.882.5880
Fax: 520.882.9788
Project Manager: Kevin Brim

RECEIVING LABORATORY:

Radiation Safety Engineering, Inc.
3245 N. Washington St.
Chandler, AZ 85225-1121
Phone : (480) 897-9459
Fax: (480) 892-5446
Please CC Kevin Brim Kbrim@turnerlabs.com

Analysis	Expires	Laboratory ID	Comments
<hr/>			
Sample ID: 18D0619-01 Drinking Water Sampled: 04/23/2018 15:55			
Radiochemistry, Gross Alpha	10/20/2018 15:55		Analyze Uranium and Adjusted Alpha if G. Alpha is > 12
Radiochemistry, Radium 226/228	05/23/2018 15:55		
Containers Supplied:			

H 60312

Released By

Date

4/30/18

16:00

ups

Received By

4/30/18

Date

16:00

Released By

Date

Received By

Date

APPENDIX D

Well Completion Documentation

PIPE TALLY

Project Name: <u>MSA Florence LPP</u>	Project No.: <u>129687-002</u>
Well No.: <u>MSA-6</u>	Date: <u>3/27/17</u>
Location: <u>Florence, AZ</u>	Pipe Tally for: <u>Well Casing</u>
Total Depth:	Geologist: <u>B. Kinsley</u>

Type of Connections: ☐ Welded ☐ T+C ☒ Flush Thread ☐ Other

Pipe	✓	Length (ft)	Length Σ (ft)	Pipe Type	Pipe	✓	Length (ft)	Length Σ (ft)	Pipe Type
1	✓	0.57	0.57	E-1 LPP	31	✓	20.02	585.82	20' PVC Screen
2	✓	5.0	5.57	5" LPP	32	✓	19.98	605.80	
3	✓	20.01	25.58	20' PVC Screen	33	✓	20.02	625.82	
4	✓	20.02	45.60	20' PVC Screen	34	✓	19.99	645.81	
5	✓	20.02	65.62		35	✓	20.02	665.83	
6	✓	20.02	85.64		36	✓	1.28	667.11	PVC Steel adapter
7	✓	20.02	105.66		37	✓	20.00	687.11	20' Steel riser
8	✓	20.02	125.68		38	✓	19.99	707.10	
9	✓	20.02	145.70		39	✓	20.00	727.10	
10	✓	20.02	165.72		40	✓	20.00	747.10	
11	✓	20.01	185.73		41	✓	19.99	767.09	
12	✓	20.02	205.75		42	✓	19.99	787.08	
13	✓	20.02	225.77		43	✓	20.00	807.08	
14	✓	20.01	245.78		44	✓	20.00	827.08	
15	✓	20.00	265.78		45	✓	19.99	847.07	
16	✓	20.02	285.8		46	✓	19.99	867.06	
17	✓	20.00	305.8		47	✓	19.99	887.05	
18	✓	20.02	325.82		48	✓	19.99	907.04	
19	✓	20.00	345.82		49	✓	19.99	927.03	
20	✓	20.02	365.84		50	✓	20.00	947.03	
21	✓	20.00	385.84		51	✓	20.00	967.03	
22	✓	20.02	405.86		52	✓	20.00	987.03	
23	✓	20.02	425.88		53	✓	20.00	1007.03	
24	✓	20.02	445.90		SUMMARY OF TALLY Total Length tallied: <u>1201.97</u> Casing Stick-Up: _____ Length of Casing Cut-Off: _____ Bottom of Well: _____ Screened Interval: _____ Total Screen in Hole: <u>665.26</u>				
25	✓	19.99	465.89						
26	✓	20.02	485.91						
27	✓	20.00	505.91						
28	✓	19.99	525.90						
29	✓	20.02	545.92						
30	✓	19.88	565.80						

Notes:

PVC Screen: 5" nominal diam
0.070 slot
 Piece #30 switched to position #3 because
 the screen was different than typical sample.
 C = casing in bottom 2' of
 PVC

HALEY ALDRICH

K:\Templates\Field Forms\Well Inst & Testing Forms.xls\Well Inst & Testing Forms.xls

to Central 20' at bottom

ESTIMATED ANNULAR MATERIAL RECORD

Project Name: <u>FCE</u>	Project #: <u>129687-002</u>	Date: <u>3-28-12</u>
Well No.: <u>MS9-0</u>	Geologist: <u>VJORD</u>	

ANNULAR VOLUME CALCULATIONS

Total Depth of Borehole [T]: <u>1210</u> feet	Total Cased Depth: <u>1199.87</u> feet
Borehole Diameter [D]: <u>10.625</u> inches	Rat Hole Volume [R=(D ²) 0.005454*L _r]: _____ Ft ³
Screen Length [L _s]: <u>665.83</u> feet	Rat Hole Length [L _r]: _____ feet
Screen Diameter [d _s]: <u>5.56</u> inches	Camera Tube Length [L _{ct}]: <u>NA</u> feet
Casing Length [L _c]: <u>1199.87</u> feet	Camera Tube Diameter [d _{ct}]: <u>NA</u> inches
Casing Diameter [d _c]: <u>5.56</u> inches	Rat hole annular vol: <u>0.62</u> Ft ³ /Ft

Screen Annular Volume (A _s): (D ² -d _s ²) 0.005454 = <u>0.45</u> Ft ³ /Lin. Ft
Casing Annular Volume (A _c): (D ² -d _c ²) 0.005454 = <u>0.45</u> Ft ³ /Lin. Ft
Casing/Cam. Tube Annular Volume (A _{c+ct}): (D ² -d _c ² -d _{ct} ²) 0.005454 = <u>NA</u> Ft ³ /Lin. Ft

EQUATIONS

2,700 lbs. Silica Sand = 1 cubic yard = 27 cubic feet

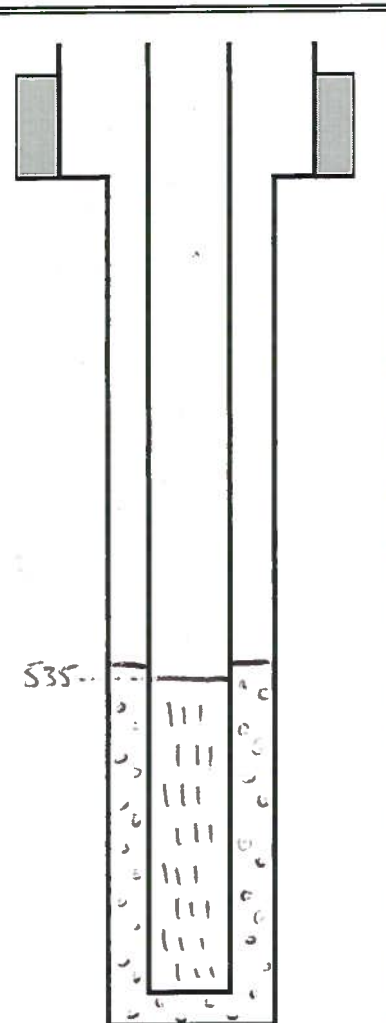
¹ Volume of bag (Ft³) = bag weight/100

² Calculated depth = Previous Calculated depth - (v/A)

Bentonite Sack = 0.69 ft³

Silica Sand Super Sack = 3000 lbs.

No.	✓	Weight of Bag (lbs.)	Volume of Bag ¹ (v) (ft ³)	Total Vol. of Bags (ft ³)	Calculated Depth ² (ft bls)	Tagged Depth (ft bls)	Comments
1	✓	3000	30	30	116 1142	1131	NO. 8x12 SILICA SAND
2	✓	3000	30	60	1064	-	"
3	✓	3000	30	90	998	986	"
4	✓	3000	30	120	919	-	"
5	✓	3000	30	150	852	851	"
6	✓	3000	30	180	784	-	"
7	✓	3000	30	210	718	708	"



Southwest tagged bottom at 1206 Ft.

[illegible]

$$(512) \cdot 0.45 = 230.4 \text{ CF} / 27 \\ = 8.5 \text{ CF}$$



LOAD NUM: 2



53670615

Plant:	Begin Loading:	To Job:	Arrive Job:	Start Unload:	Finish Unload:	Leave Job:	Return Plant:
D11/4111	1535	1545	1635	1645			

Customer Code: 3181157	Customer Name: FLORENCE COPPER INC	Customer Job Number: FLORENCE WELL	Order Code / Date: 6332 03/28/17
Project Code: 41097304	Project Name: FLORENCE WELL	Project P.O. Number: NO	Order P.O. Number: NO
Ticket Date: 03/28/17	Delivery Address: 1575 W HUNT HIGHWAY NO SOONER	Map Page: PIN	Map/Row/Column: PINMY201
Delivery Instructions: HUNT HWY & E/ FELIX RD. RUN SPRAY BARS		Dispatcher: vstewart	Ticket Number: 44069893

Due On Job: 16:30	Slump: 11.00	Truck Number: 10031949	Driver Number: 411292	Driver Name: LEWIS, CHRISTINE	End Use: GRT BLDNG: OTHER
----------------------	-----------------	---------------------------	--------------------------	----------------------------------	------------------------------

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	MATERIAL CODE	PRODUCTION DESCRIPTION	UOM	UNIT PRICE	AMOUNT
7.00	7.00	13.00	1333049	TYPE II/V SLURRY 21 SK CMT/W YD3			
				LEGACY MATERIAL NO:			
1.00	1.00	1.00	1349968	SATURDAY OPENING	EA		
1.00			1247818	FUEL SURCHARGE ADJ			
1.00			1202749	ENVIRONMENTAL FEE			
1.00			1572392	FREIGHT_NON_TAXABLE_ARIZONA			

MAR 28'17 15:35

<input type="checkbox"/> Cash <input type="checkbox"/> Check <input type="checkbox"/> Charge	Check # / Auth Code: _____	Signature of Driver Receiving Cash: _____	Cash Received: _____	Total COD Order Amount to Collect Without Standby Charges: _____
Comments: _____			WATER ADDED: 0 GAL YARDS IN DRUM: 7.0 WHEN ADDED.	
			SIGNATURE _____	
			CURB LINE CROSSED AT OWNER'S/AGENT'S REQUEST: _____	
			SIGNATURE _____	
			<input type="checkbox"/> LOAD WAS TESTED BY: _____	

Notice: Our drivers will make every effort to place materials where the customer designates, but the Company assumes no responsibility for damages inside curb or property line. Customer agrees to the terms of sale and delivery and accepts concrete as is. Due to important factors which are out of our control after delivery, this Company will not accept any responsibility for the finished results. No credit for returned concrete. Buyers exceptions and claims shall be deemed waived unless made to us in writing within one business day after the receipt of materials.

SPECIAL TERMS: Any water added is at customers own risk. If water is added on job, concrete strength is no longer guaranteed. **WARNING:** Product may cause skin and/or eye irritation. **CAUTION:** Material may be hazardous to your safety and health. Please refer to the backside of this ticket for important safety handling information, and to the material safety data sheets for additional information.

AUTHORIZED SIGNATURE:

⊗

APPENDIX E

Geophysical Logs



Southwest Exploration Services, LLC

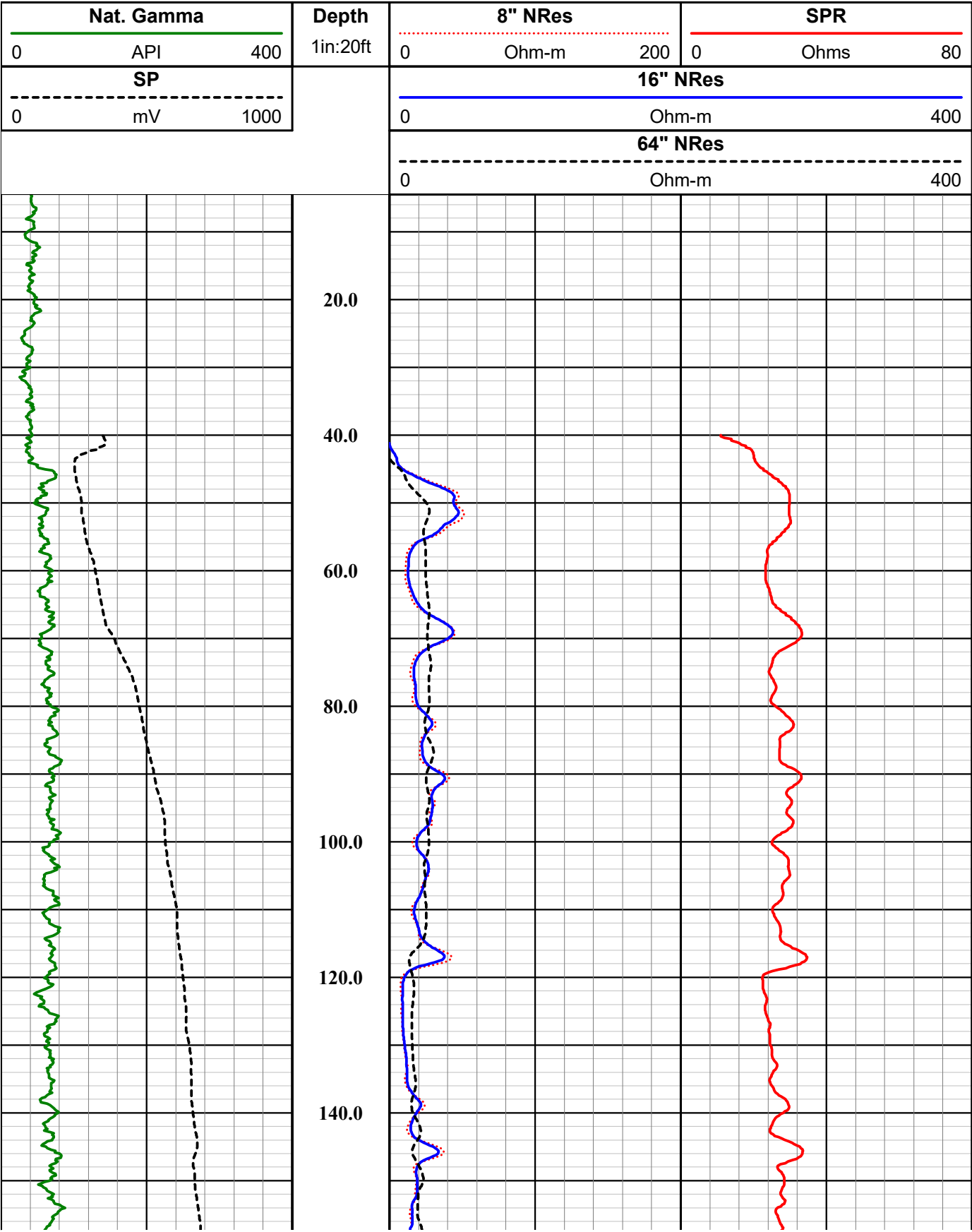
borehole geophysics & video services

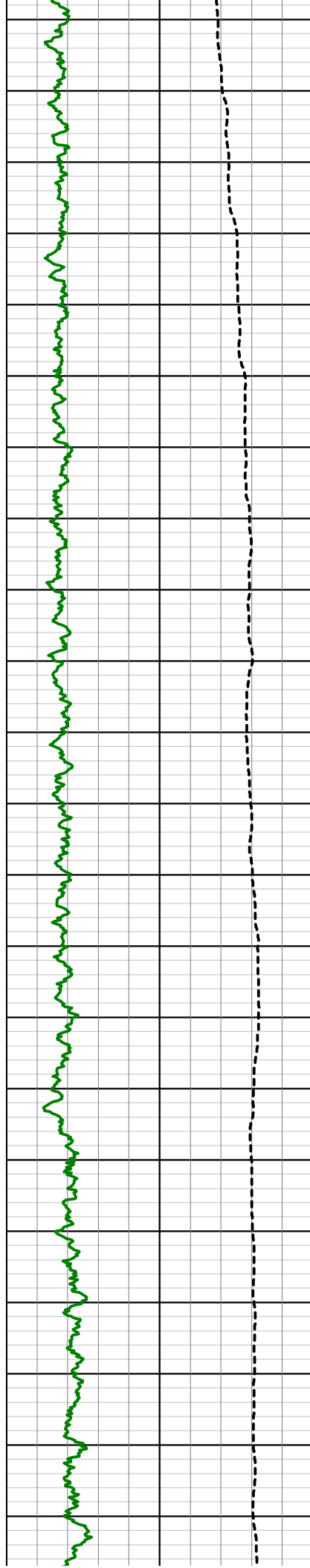
COMPANY FLORENCE COPPER	
WELL ID M60-0	
FIELD FLORENCE COPPER	
COUNTY PINAL	STATE ARIZONA
TYPE OF LOGS: E-LOGS	
MORE: NAT. GAMMA	
LOCATION	OTHER SERVICES COMBO TOOL SONIC DEVIATION
SEC	TWP RGE
PERMANENT DATUM	
ELEVATION	K.B.
LOG MEAS. FROM GROUND LEVEL	ABOVE PERM. DATUM D.F.
DRILLING MEAS. FROM GROUND LEVEL	G.L.
DATE	4-8-17
TYPE FLUID IN HOLE	MUD
RUN No 2	MUD WEIGHT N/A
TYPE LOG	ELOGS-GAMMA
VISCOSITY	N/A
DEPTH-DRILLER	1214 FT.
LEVEL	FULL
DEPTH-LOGGER	1214 FT.
MAX. REC. TEMP.	32.5 DEG. C
BTM LOGGED INTERVAL	1214 FT.
IMAGE ORIENTED TO:	N/A
TOP LOGGED INTERVAL	SURFACE
SAMPLE INTERVAL	0.2 FT
DRILLER / RIG#	NATIONAL
LOGGING TRUCK	TRUCK #900
RECORDED BY / Logging Eng.	E. TURNER
TOOL STRING/SN	MSI POLYPROBE SN 3604
WITNESSED BY	CHAD - H&A
LOG TIME:ON SITE/OFF SITE	6:00 AM
BOREHOLE RECORD	
CASING RECORD	
NO.	BIT FROM
TO	SIZE
WGT.	FROM
STEEL	SURFACE
40 FT.	TO
1	?
SURFACE	40 FT.
14 IN.	
2	10 5/8 IN.
40 FT.	TOTAL DEPTH
3	
COMMENTS:	

Tool Summary:					
Date	4-8-17	Date	4-8-17	Date	4-8-17
Run No.	1	Run No.	2	Run No.	3
Tool Model	MSI COMBO TOOL	Tool Model	MSI POLYPROBE	Tool Model	MSI 60MM SONIC
Tool SN	4183	Tool SN	3604	Tool SN	6003
From	SURFACE	From	SURFACE	From	SURFACE
To	1214 FT.	To	1214 FT.	To	1214 FT.
Recorded By	E. TURNER	Recorded By	E. TURNER	Recorded By	E. TURNER
Truck No	900	Truck No	900	Truck No	900
Operation Check	4-6-17	Operation Check	4-6-17	Operation Check	4-6-17
Calibration Check	3-25-17	Calibration Check	3-25-17	Calibration Check	N/A
Time Logged	07:30 AM	Time Logged	09:30 AM	Time Logged	10:30 AM
Date	4-8-17	Date		Date	
Run No.	4	Run No.	5	Run No.	6
Tool Model	MSI 2DVA	Tool Model		Tool Model	
Tool SN	3082	Tool SN		Tool SN	
From	SURFACE	From		From	
To	1214 FT	To		To	
Recorded By	E. TURNER	Recorded By		Recorded By	
Truck No	900	Truck No		Truck No	
Operation Check	4-6-17	Operation Check		Operation Check	
Calibration Check	N/A	Calibration Check		Calibration Check	
Time Logged	11:45 AM	Time Logged		Time Logged	
Additional Comments:					
Caliper Arms Used: 9 IN.		Calibration Points: 3.5 IN. & 16 IN.			
Tool Calibration Date: 4-10-2016 GUMM		Tool Calibration Date: 4-10-2016 GUMM			

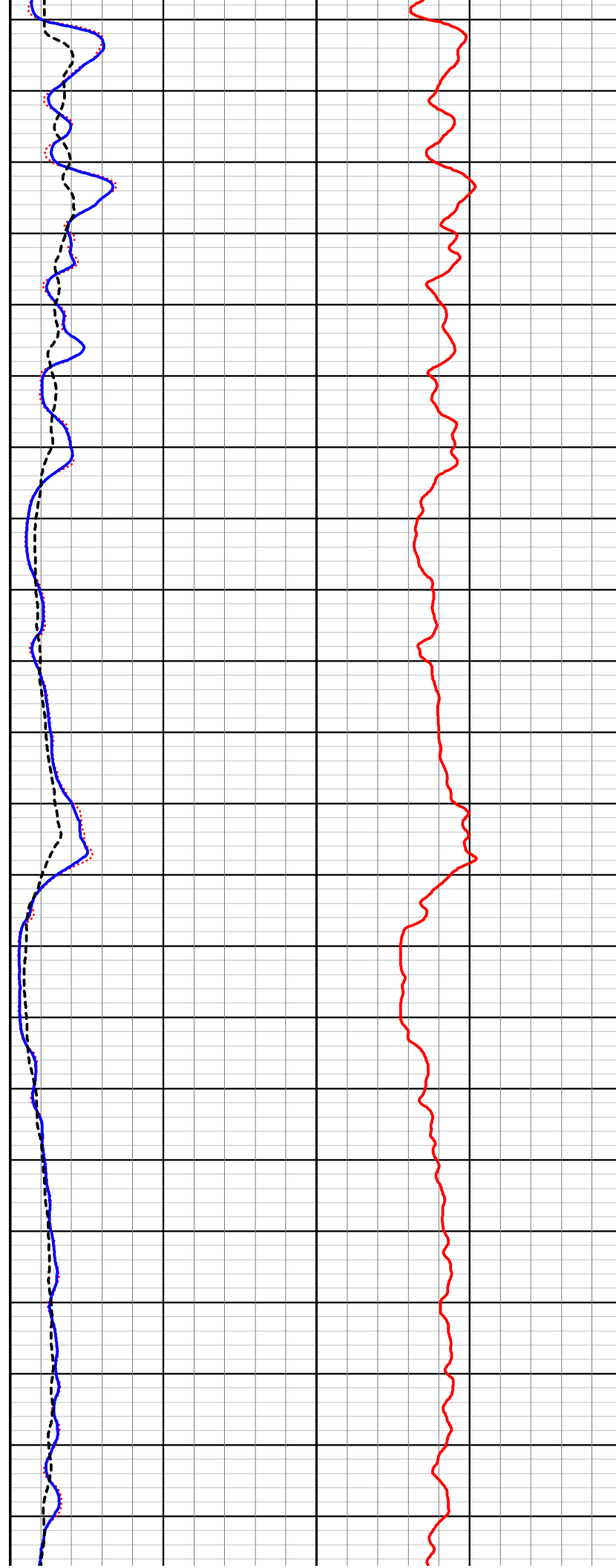
Disclaimer:

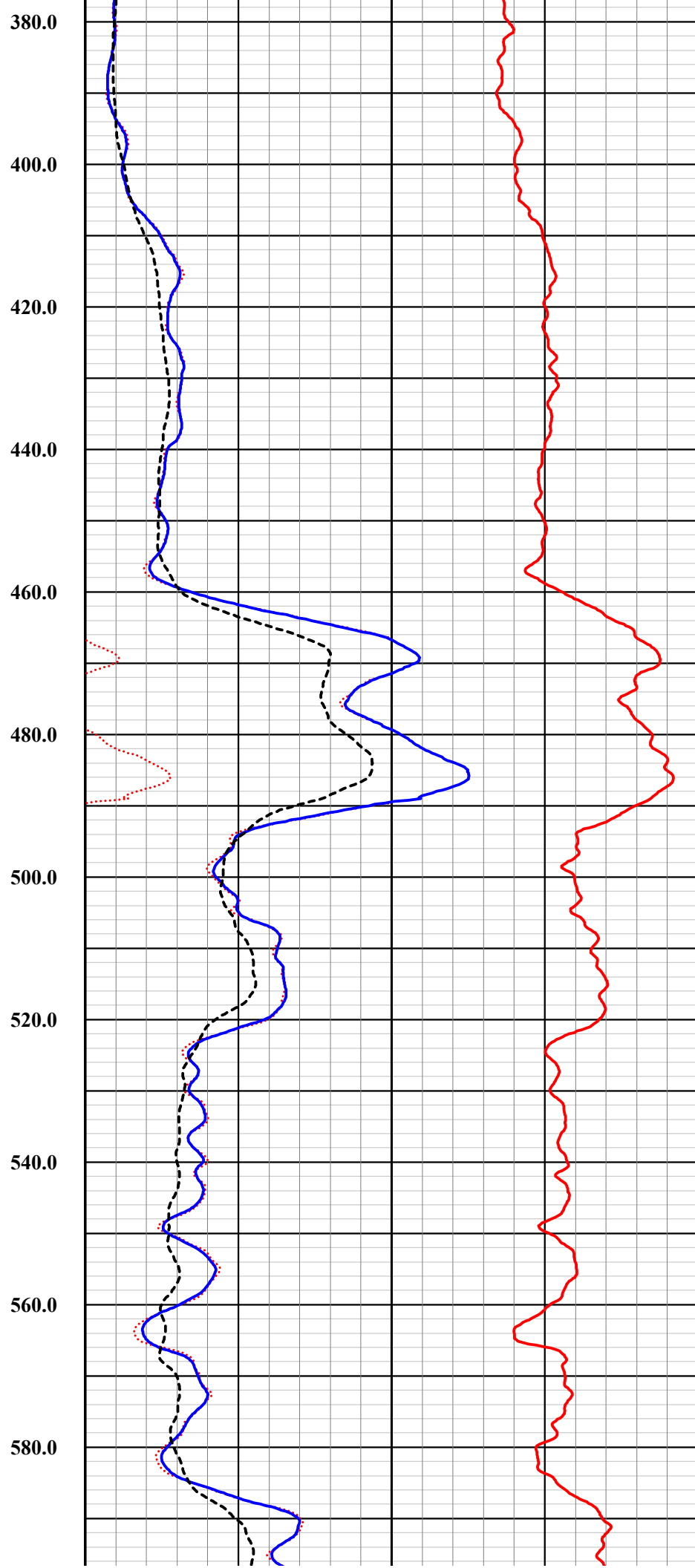
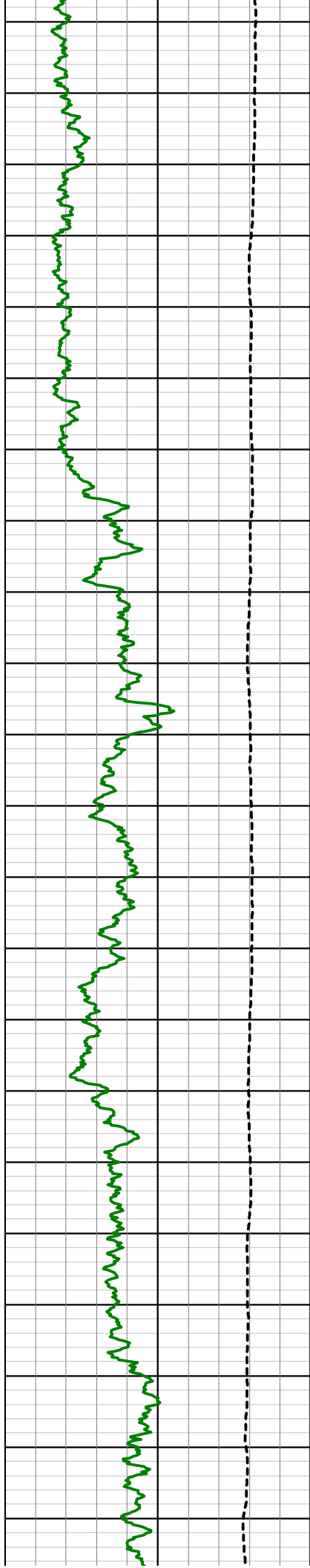
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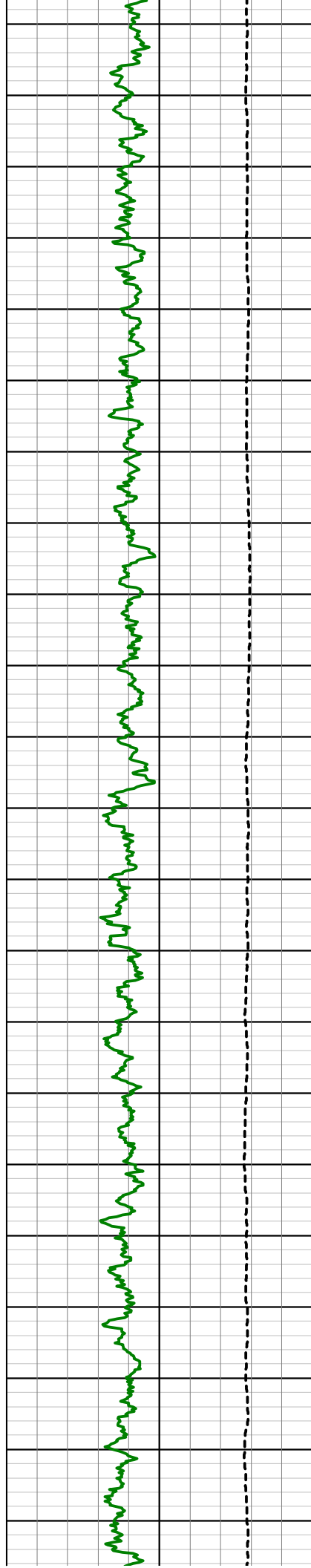




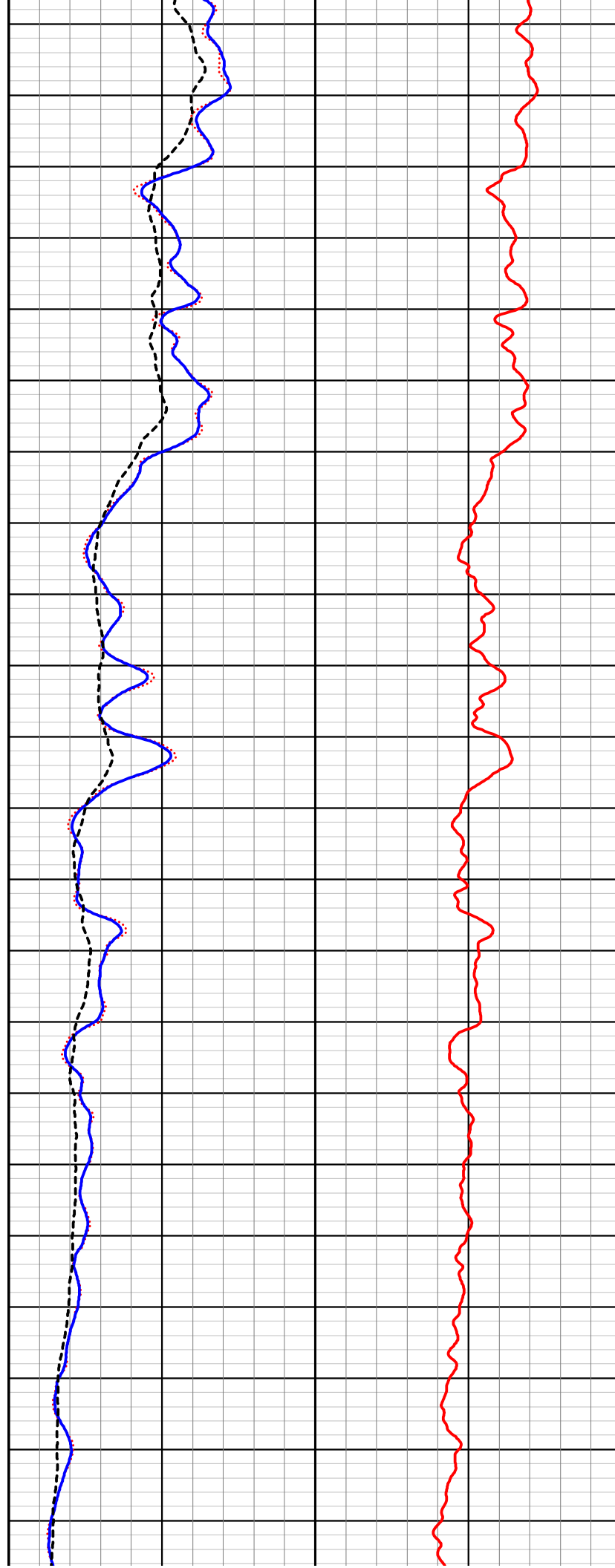
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360.0

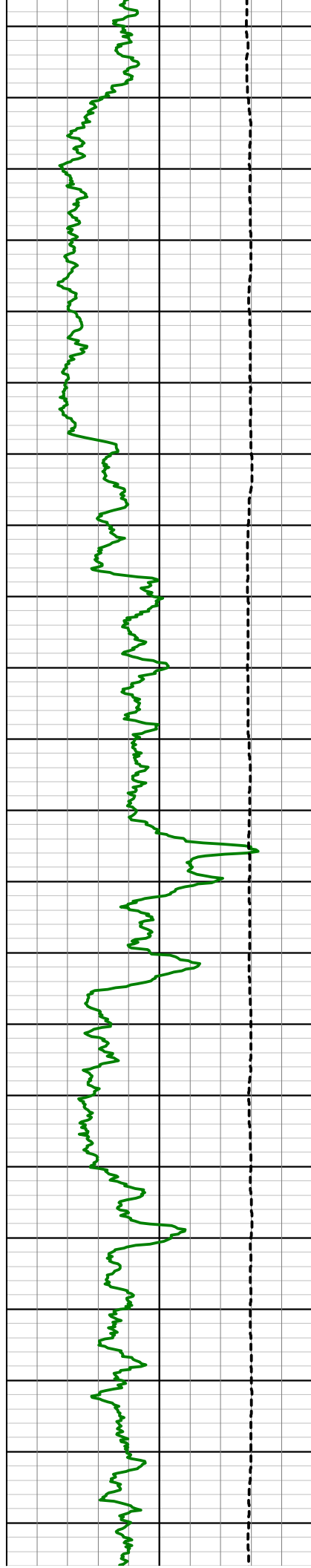




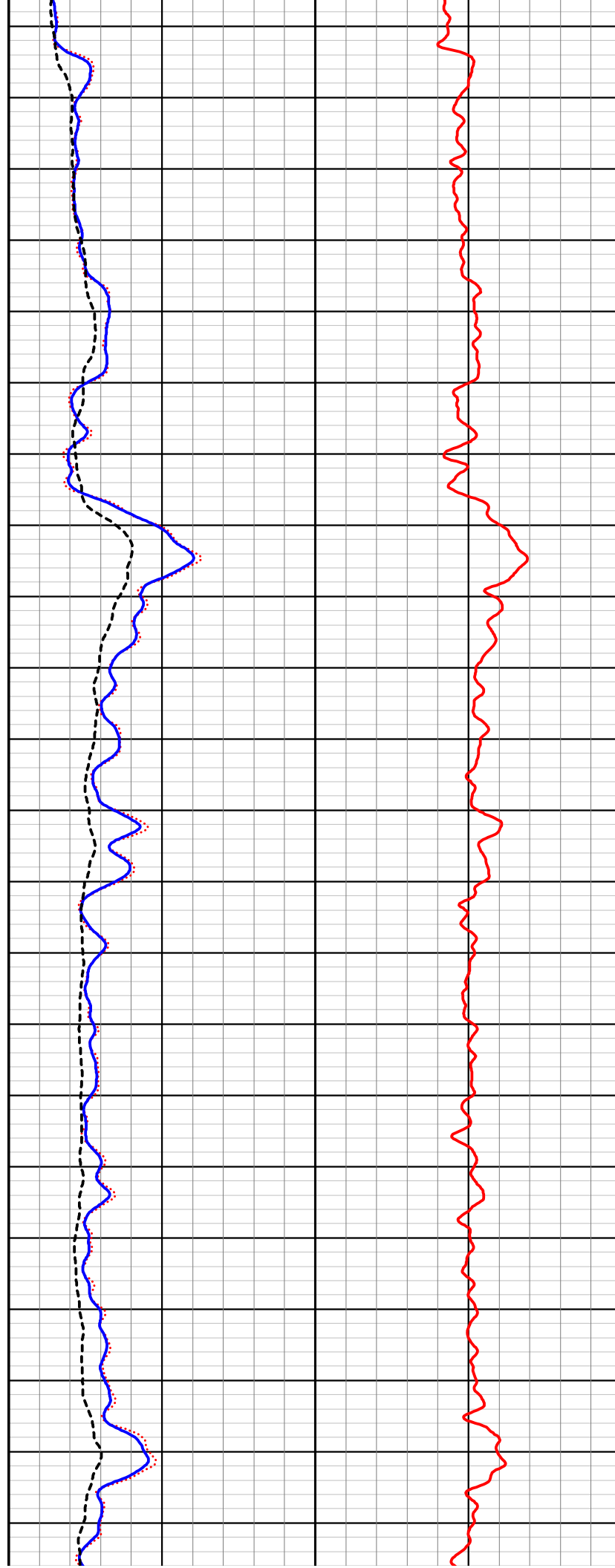


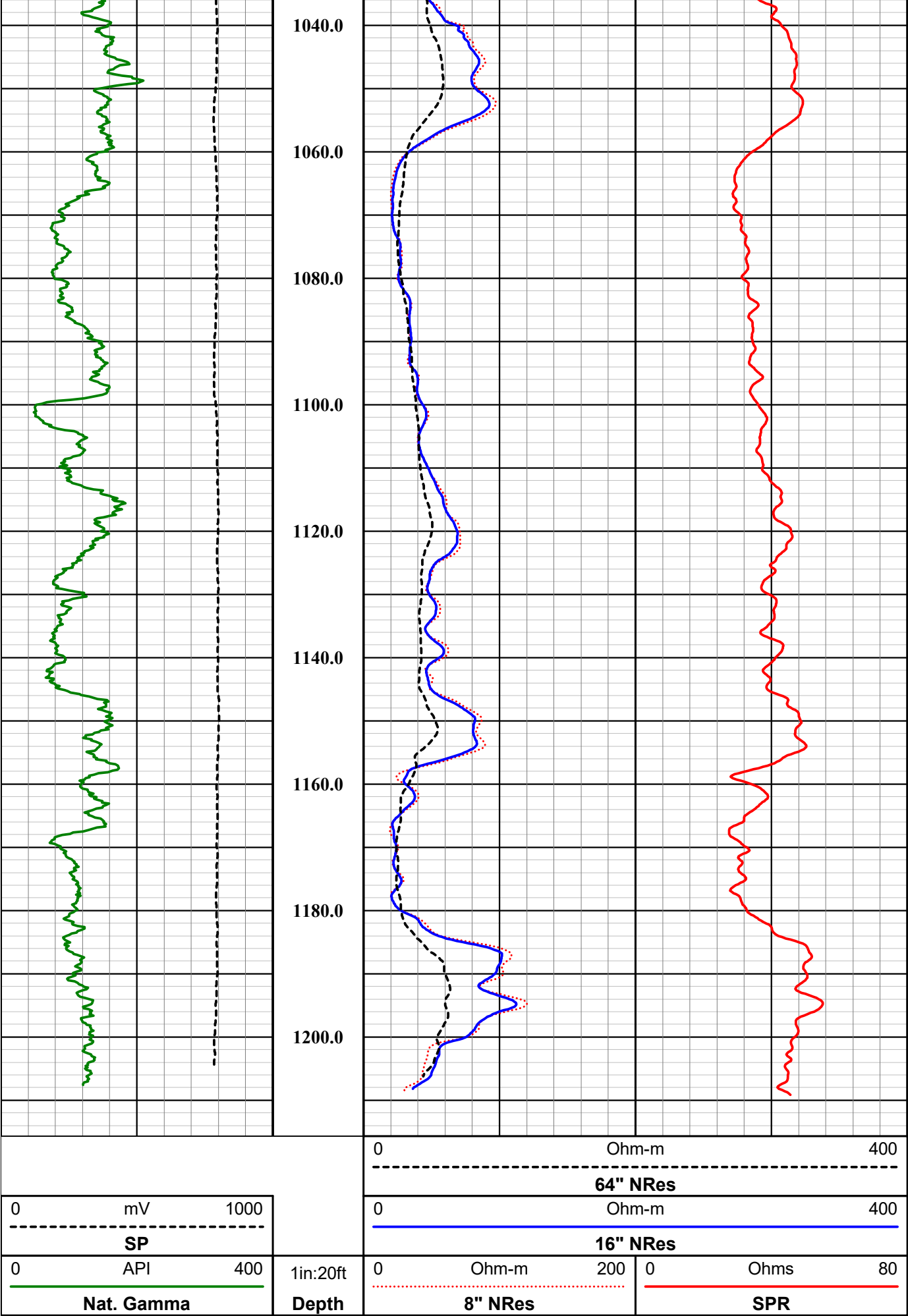
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700.0
720.0
740.0
760.0
780.0
800.0





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900.0
920.0
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960.0
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1000.0
1020.0

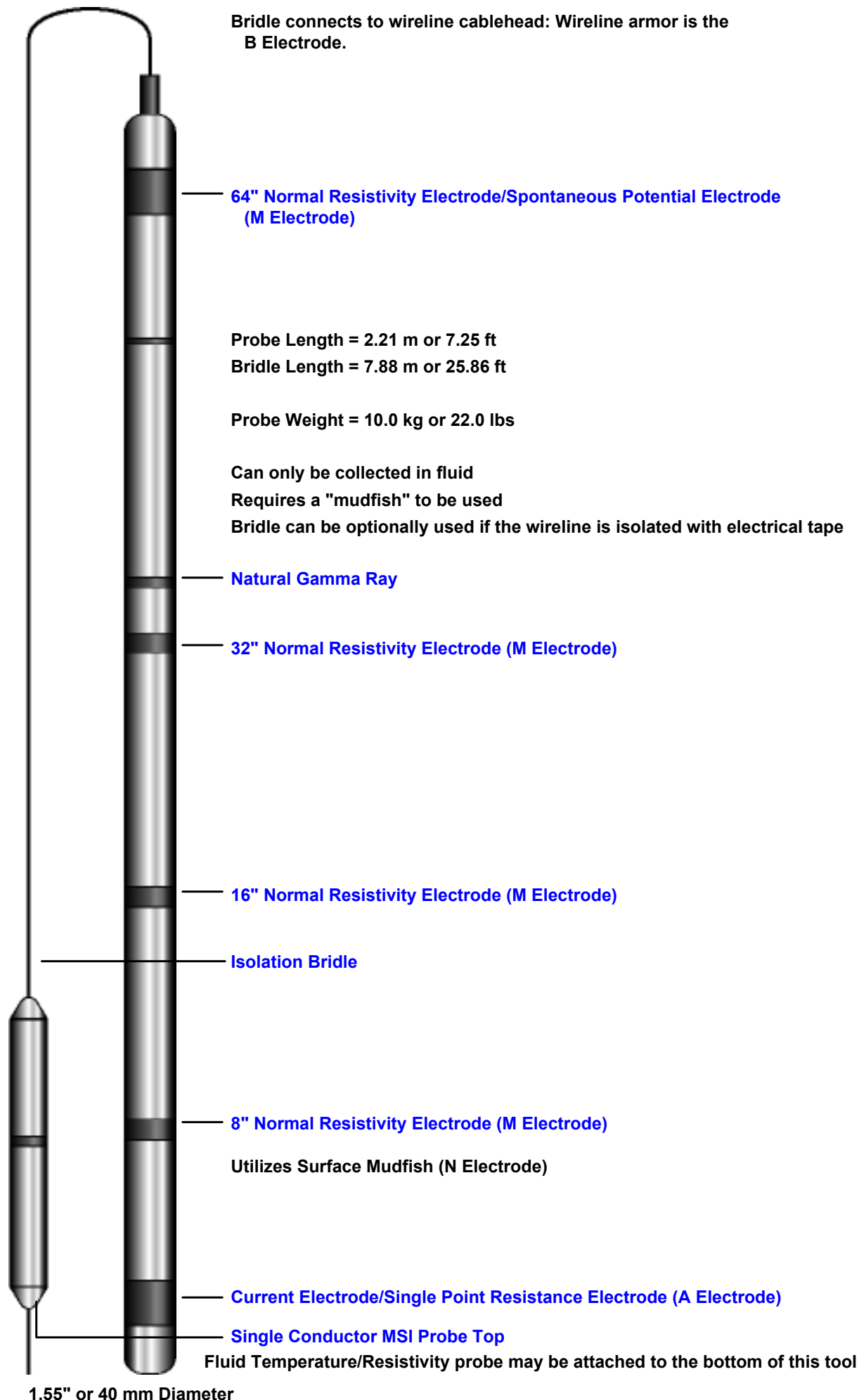




Probe Top = Depth Ref.

Tool SN: 4067 & 3604

Bridle connects to wireline cablehead: Wireline armor is the B Electrode.





**Southwest Exploration
Services, LLC**

borehole geophysics & video services

Company

FLORENCE COPPER

Well

M60-0

Field

FLORENCE COPPER

County

PINAL

State

ARIZONA

Final

E-Log Summary



Southwest Exploration Services, LLC

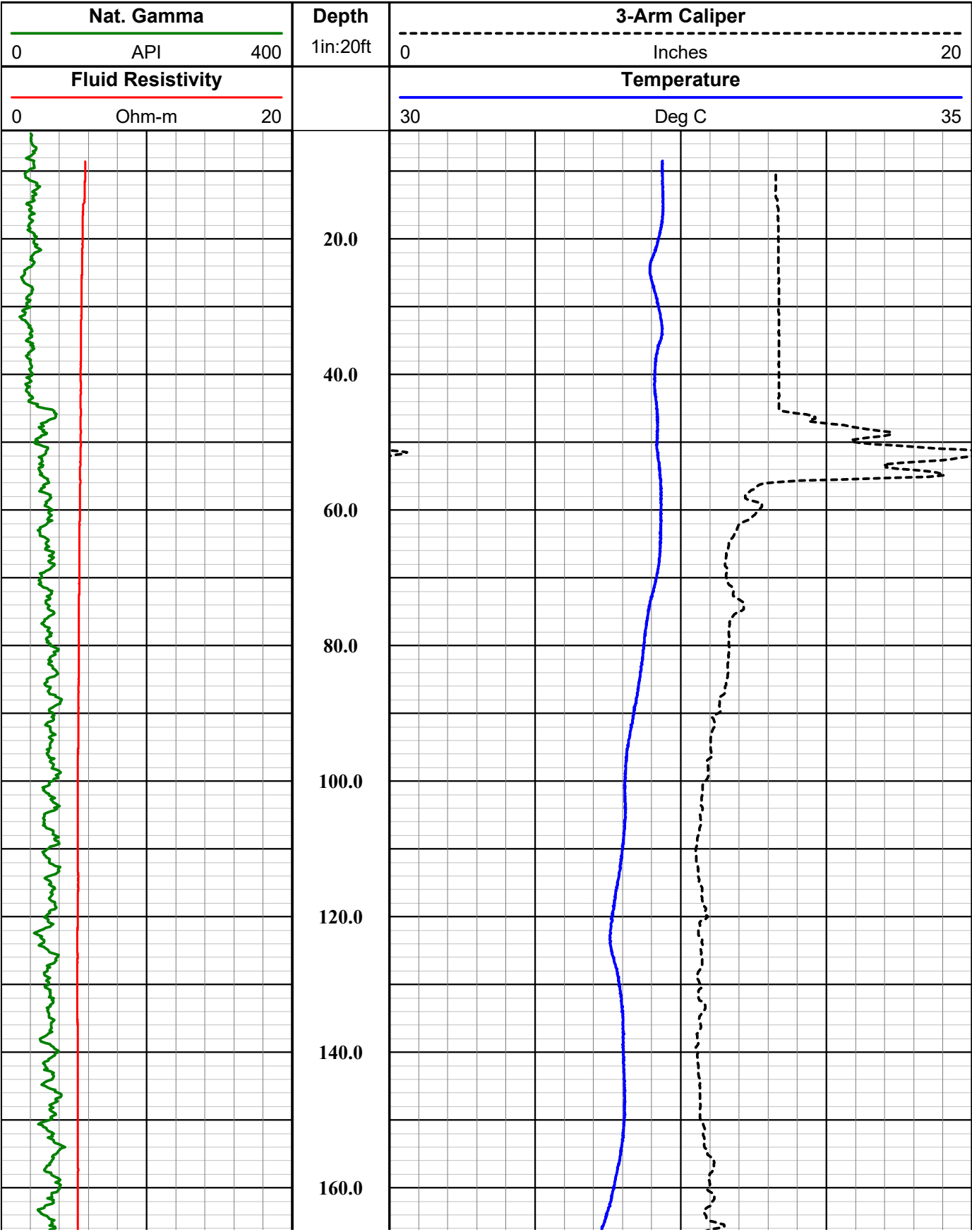
borehole geophysics & video services

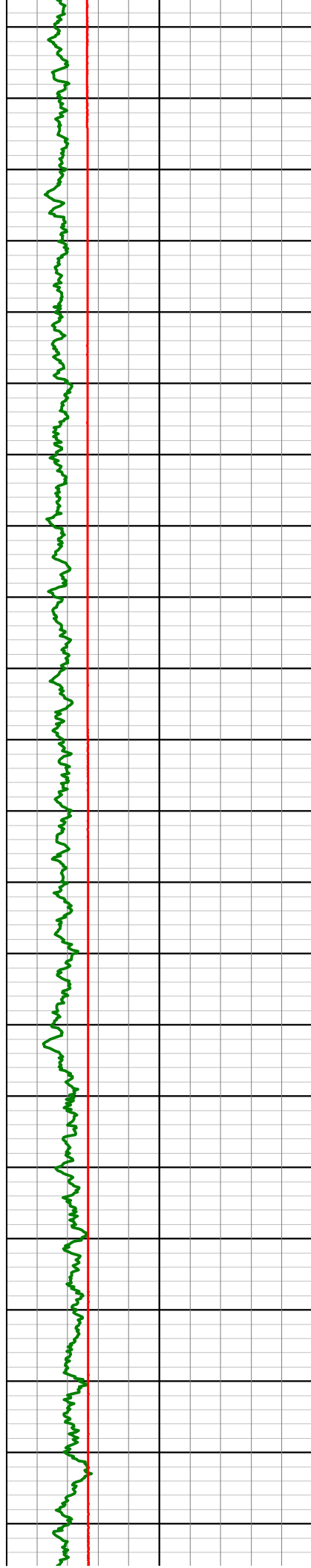
COMPANY FLORENCE COPPER	
WELL ID M60-0	
FIELD FLORENCE COPPER	
COUNTY PINAL	STATE ARIZONA
TYPE OF LOGS: GAMMA - CALIPER	
MORE: TEMP. / FLUID RES.	
LOCATION	OTHER SERVICES E-LOGS SONIC DEVIATION
SEC	TWP RGE
PERMANENT DATUM	
ELEVATION	K.B.
LOG MEAS. FROM GROUND LEVEL	ABOVE PERM. DATUM D.F.
DRILLING MEAS. FROM GROUND LEVEL	G.L.
DATE	4-8-17
TYPE FLUID IN HOLE	MUD
RUN No 1	MUD WEIGHT N/A
TYPE LOG GAMMA - CALIPER - TFR	VISCOSITY N/A
DEPTH-DRILLER 1214 FT.	LEVEL FULL
DEPTH-LOGGER 1214 FT.	MAX. REC. TEMP. 32.5 DEG. C
BTM LOGGED INTERVAL 1214 FT.	IMAGE ORIENTED TO: N/A
TOP LOGGED INTERVAL SURFACE	SAMPLE INTERVAL 0.1 FT
DRILLER / RIG# NATIONAL	LOGGING TRUCK TRUCK #900
RECORDED BY / Logging Eng. E. TURNER	TOOL STRING/SN MSI COMBO TOOL SN 4183
WITNESSED BY CHAD - H&A	LOG TIME:ON SITE/OFF SITE 6:00 AM
BOREHOLE RECORD	
CASING RECORD	
NO. BIT	FROM TO
1 ?	SURFACE 40 FT. 14 IN. STEEL SURFACE 40 FT.
2 10 5/8 IN.	40 FT. TOTAL DEPTH
3	
COMMENTS:	

Tool Summary:					
Date	4-8-17	Date	4-8-17	Date	4-8-17
Run No.	1	Run No.	2	Run No.	3
Tool Model	MSI COMBO TOOL	Tool Model	MSI POLYPROBE	Tool Model	MSI 60MM SONIC
Tool SN	4183	Tool SN	3604	Tool SN	6003
From	SURFACE	From	SURFACE	From	SURFACE
To	1214 FT.	To	1214 FT.	To	1214 FT.
Recorded By	E. TURNER	Recorded By	E. TURNER	Recorded By	E. TURNER
Truck No	900	Truck No	900	Truck No	900
Operation Check	4-6-17	Operation Check	4-6-17	Operation Check	4-6-17
Calibration Check	3-25-17	Calibration Check	3-25-17	Calibration Check	N/A
Time Logged	07:30 AM	Time Logged	09:30 AM	Time Logged	10:30 AM
Date	4-8-17	Date		Date	
Run No.	4	Run No.	5	Run No.	6
Tool Model	MSI 2DVA	Tool Model		Tool Model	
Tool SN	3082	Tool SN		Tool SN	
From	SURFACE	From		From	
To	1214 FT	To		To	
Recorded By	E. TURNER	Recorded By		Recorded By	
Truck No	900	Truck No		Truck No	
Operation Check	4-6-17	Operation Check		Operation Check	
Calibration Check	N/A	Calibration Check		Calibration Check	
Time Logged	11:45 AM	Time Logged		Time Logged	
Additional Comments:					
Caliper Arms Used: 9 IN.					
Calibration Points: 3.5 IN. & 16 IN.					

Disclaimer:

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180.0

200.0

220.0

240.0

260.0

280.0

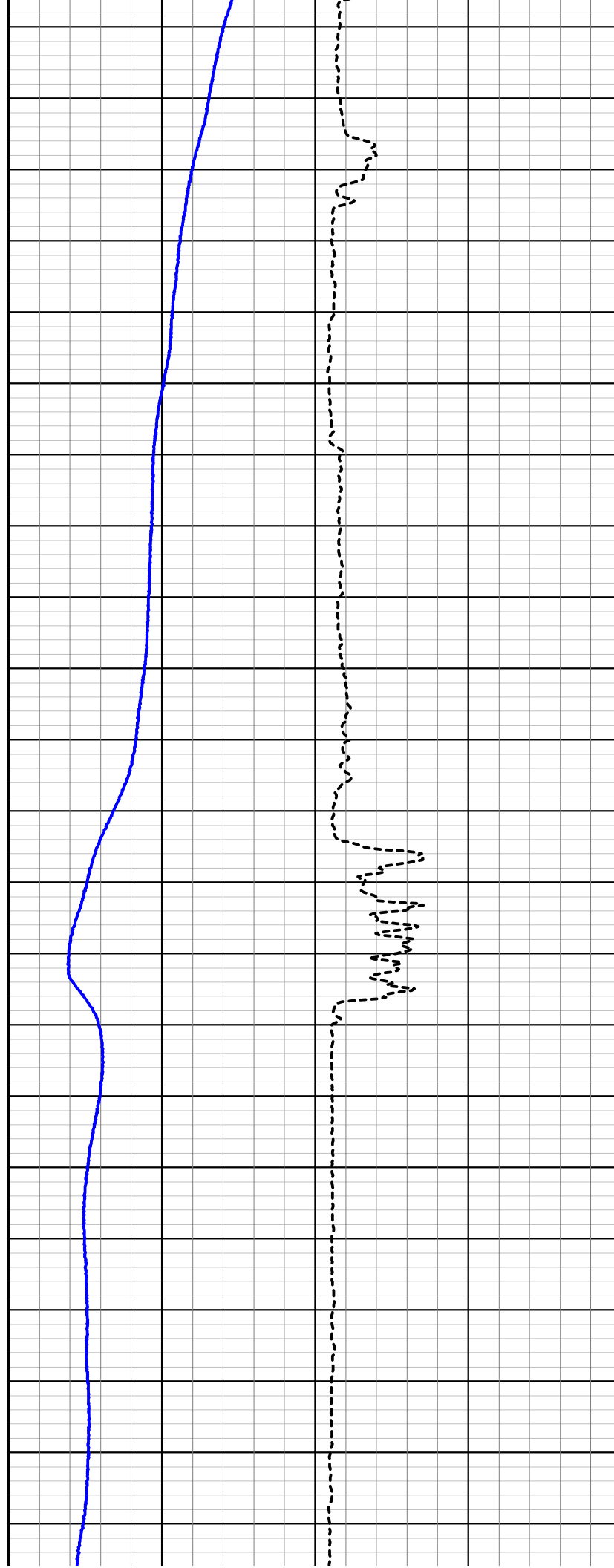
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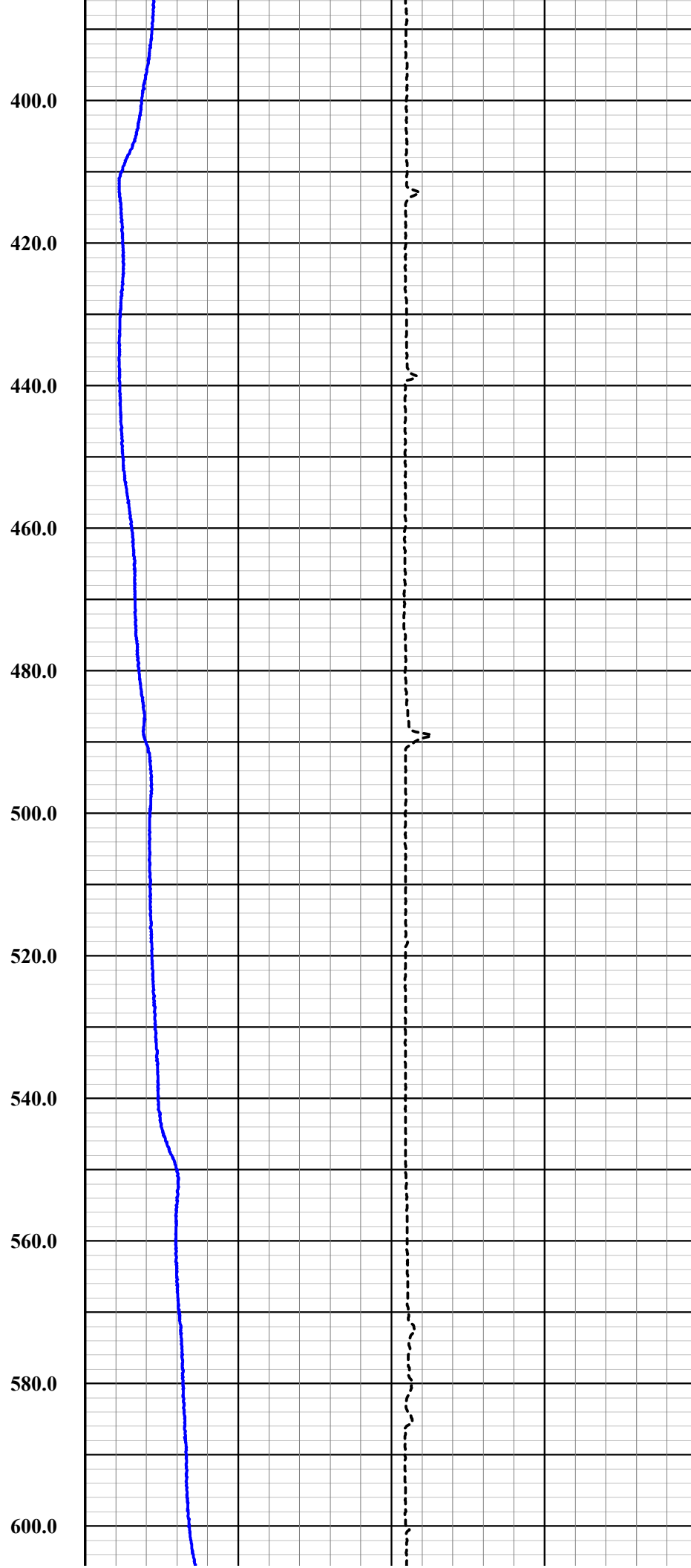
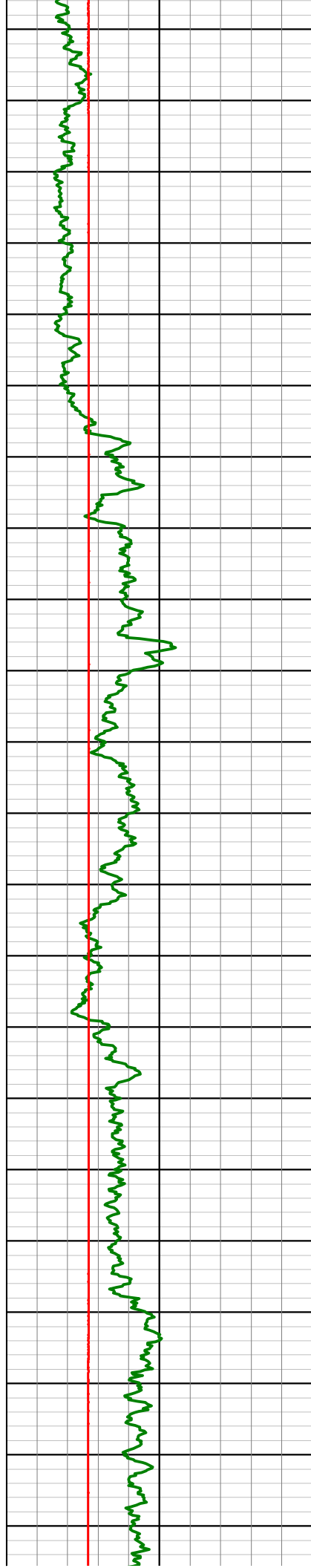
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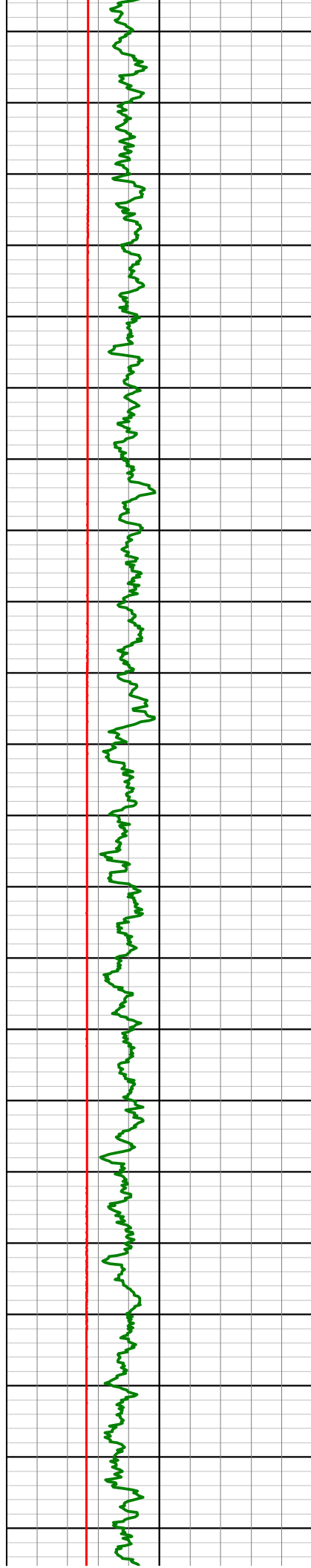
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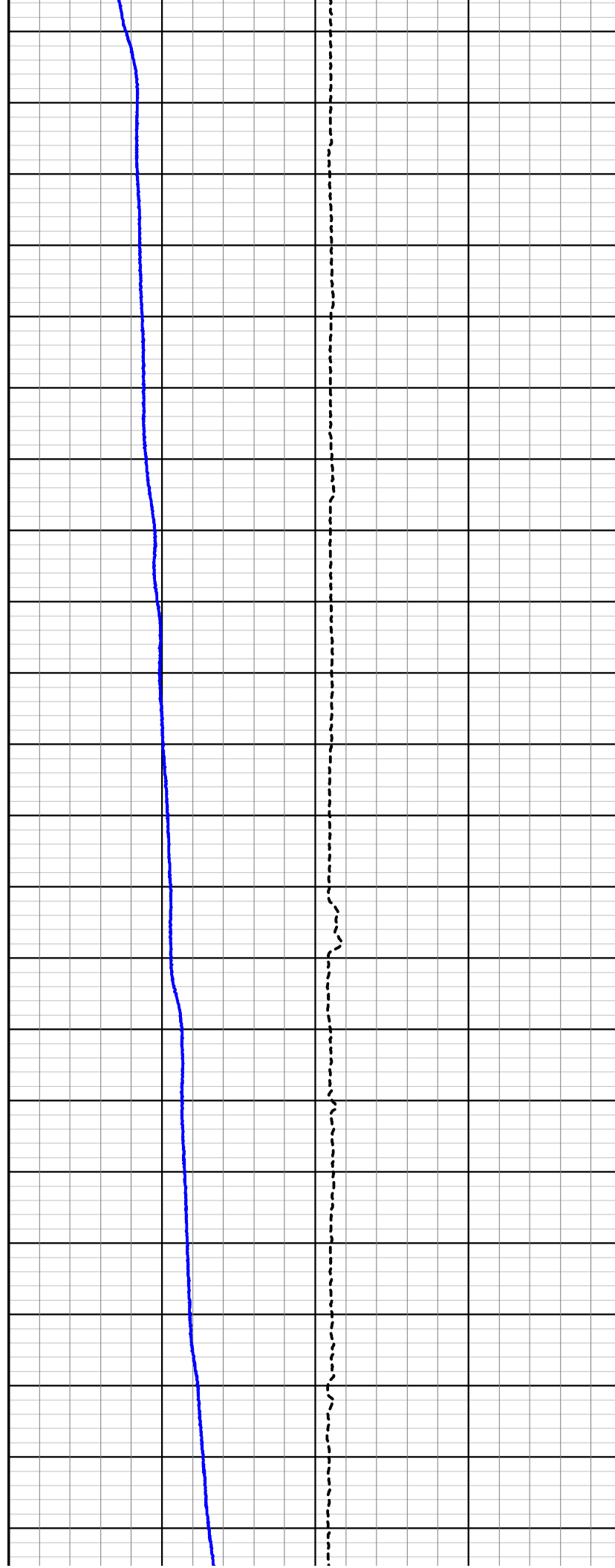
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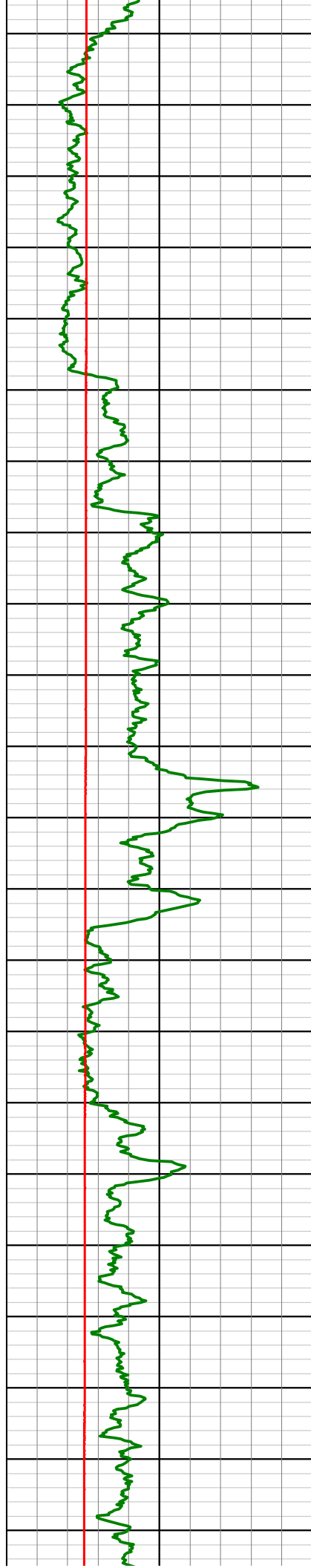
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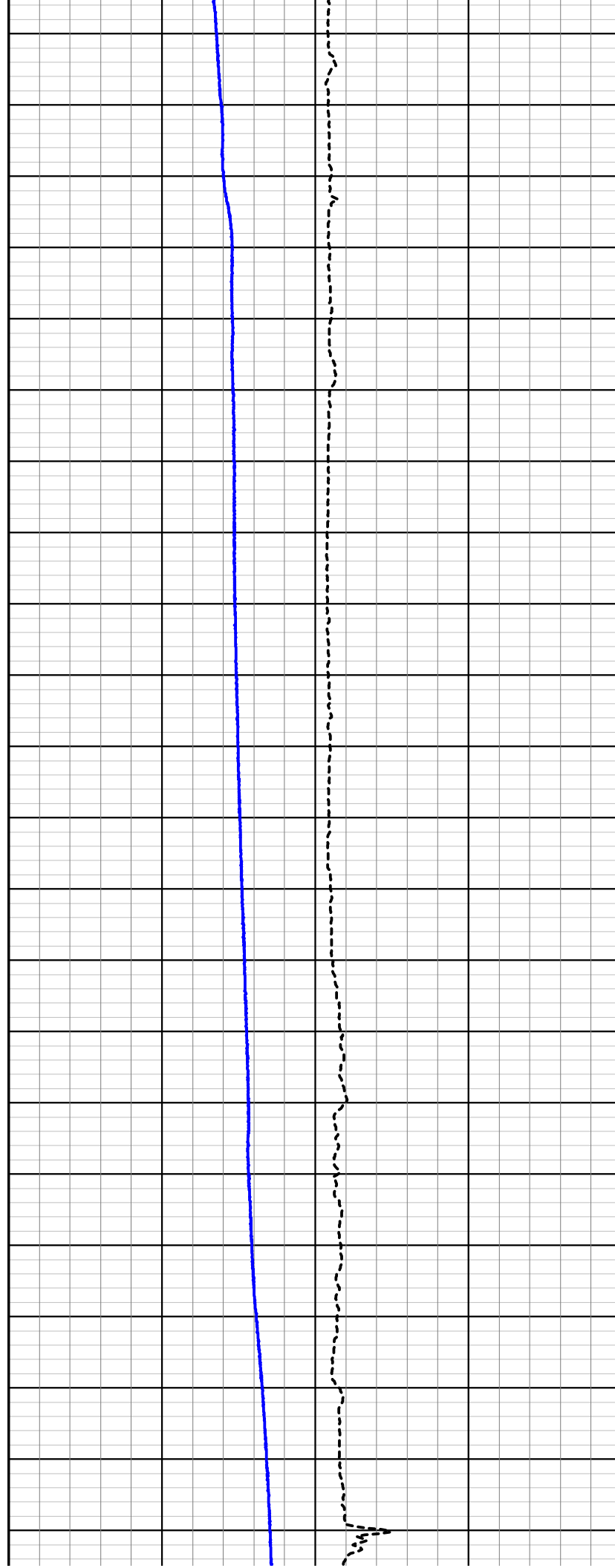
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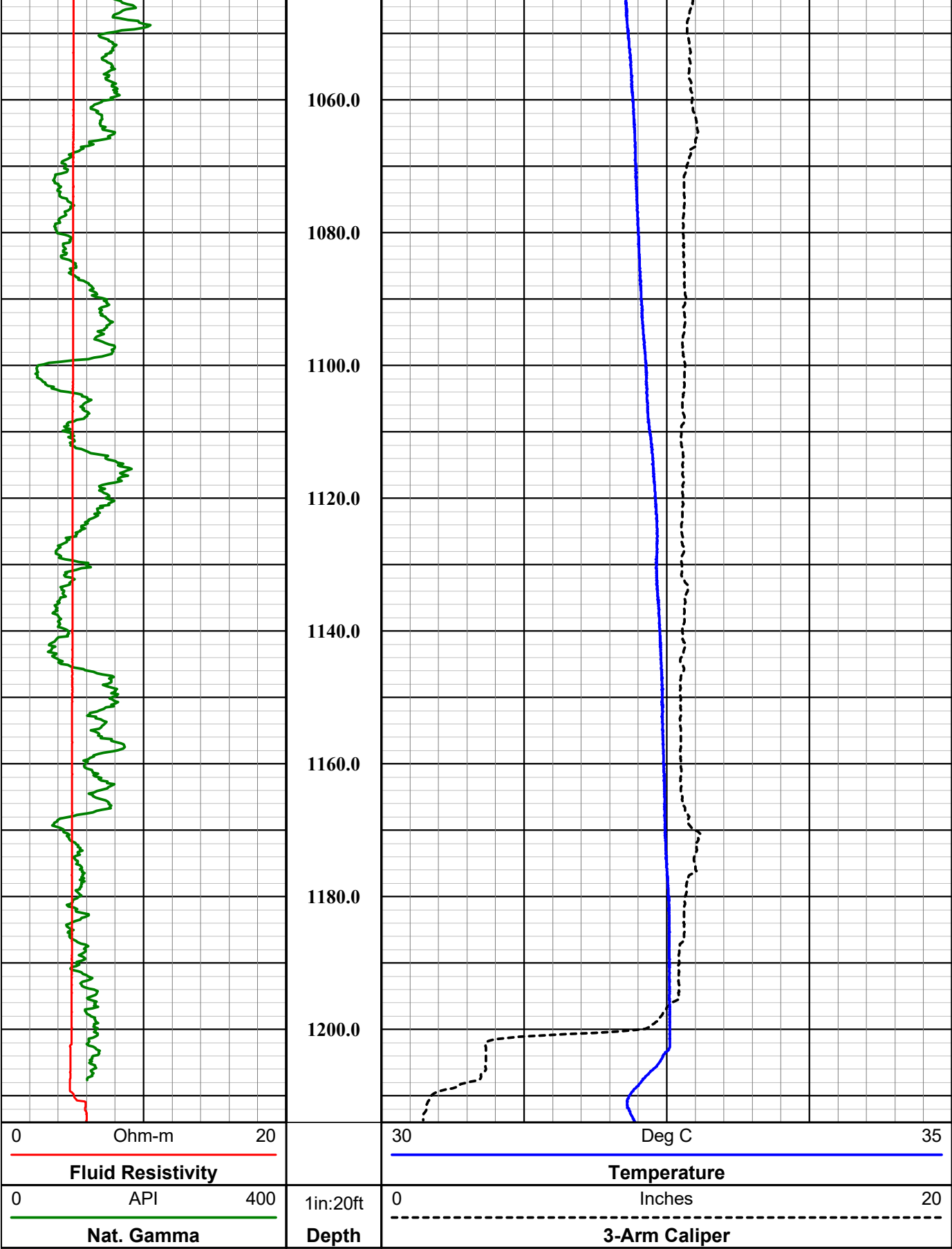
980.0

1000.0

1020.0

1040.0





MSI Gamma-Caliper-Temperature-Fluid Resistivity

Probe Top = Depth Ref.



Single Conductor MSI Probe Top

Probe Length = 2.59 m or 8.5 ft
Probe Weight = 6.80 kg or 15.0 lbs

Natural Gamma and Caliper can only be collected logging up hole.

Fluid Temperature/Resistivity can only be collected logging down hole.

Temperature Rating: 70 Deg C (158 Deg F)
Pressure Rating: 200 bar (2900 psi)

———— Natural Gamma Ray = 0.76 m (29.75 in)

NOTE: Lengths on a particular tool may vary from those listed on this document due to probe sizes and styles utilized

———— 3-Arm Caliper = 1.44 m (56.75 in)

Distance from tool top: 2.20 m (86.5 in)

Available Arm Sizes: 3", 9", and 15"

———— TFR (Temperature/Fluid Resistivity) = 0.39 m (15.5 in)

1.375" or 34.9 mm Diameter



**Southwest Exploration
Services, LLC**

Company FLORENCE COPPER

Well M60-0
Field FLORENCE COPPER



borehole geophysics & video services

County
State

PINAL
ARIZONA

Final

GCT Summary



Southwest Exploration Services, LLC

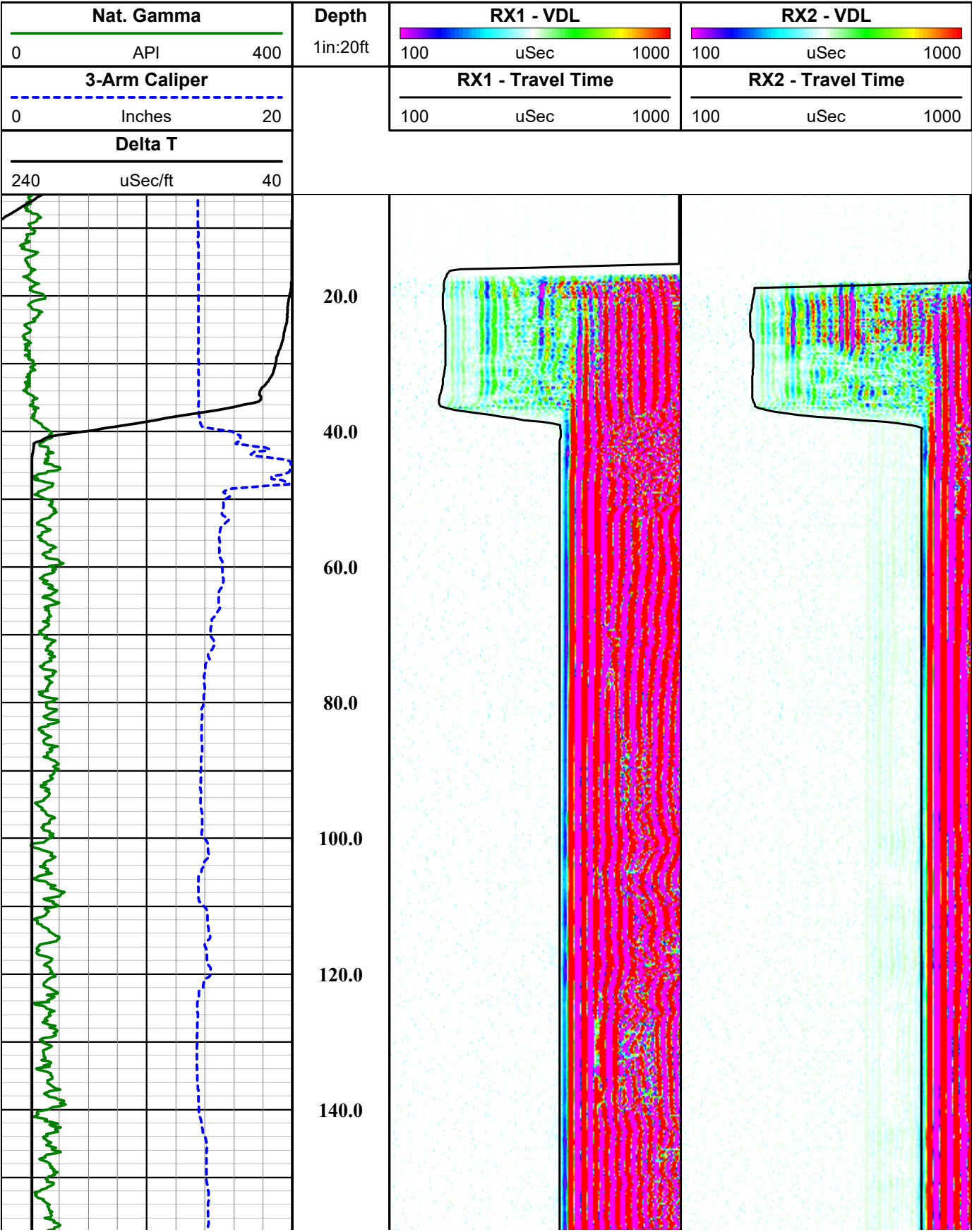
borehole geophysics & video services

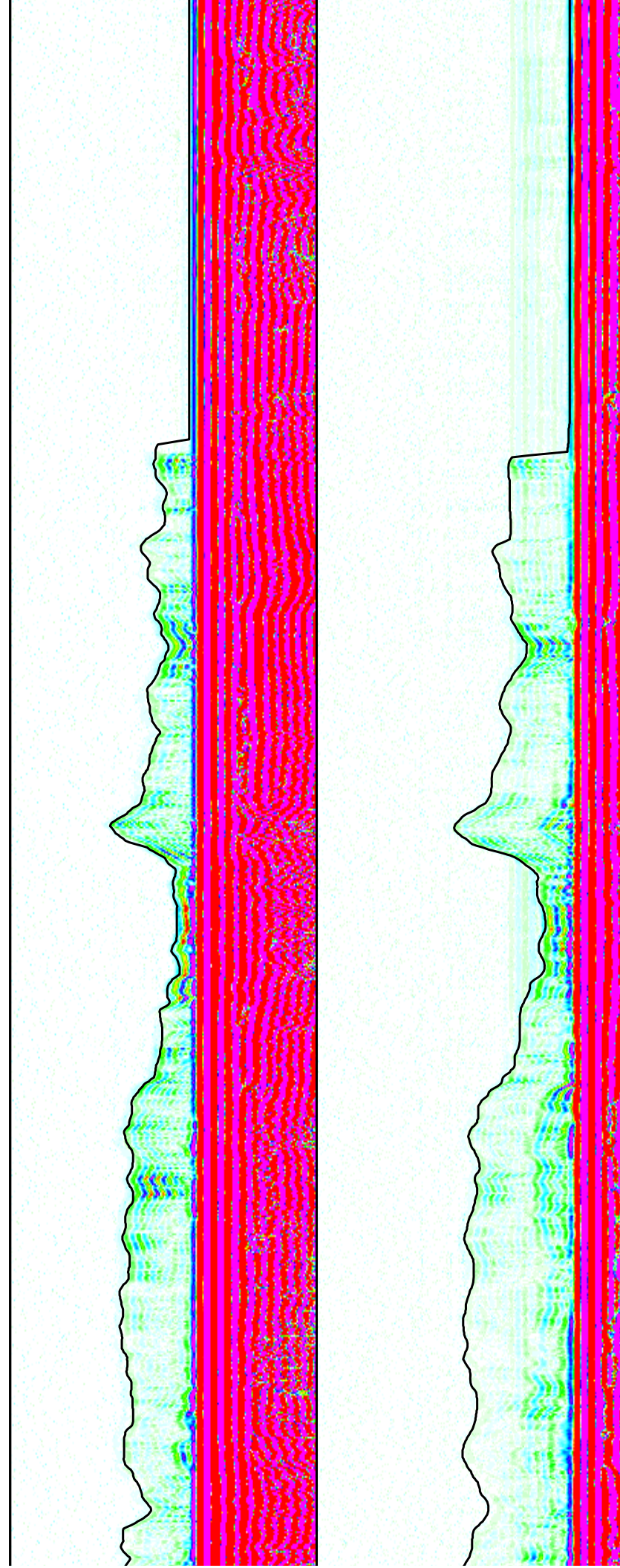
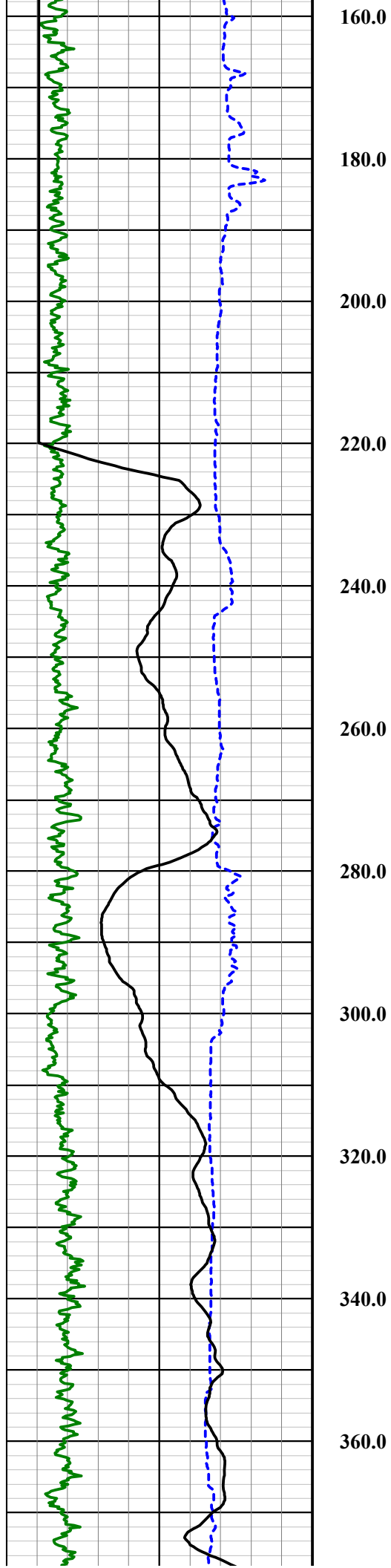
COMPANY FLORENCE COPPER				TYPE OF LOGS: 60MM SONIC				OTHER SERVICES	
WELL ID O-03				NAT. GAMMA-CALIPER				ELOGS	
FIELD FLORENCE COPPER								DEVIATION	
COUNTY PINAL								TEMPERATURE	
								FLUID RES.	
LOCATION									
SEC				TWP		RGE			
PERMANENT DATUM				ELEVATION				K.B.	
LOG MEAS. FROM GROUND LEVEL				ABOVE PERM. DATUM				D.F.	
DRILLING MEAS. FROM GROUND LEVEL								G.L.	
DATE		5-5-17		TYPE FLUID IN HOLE		MUD			
RUN No		1/3		MUD WEIGHT		N/A			
TYPE LOG		SONIC-CAL-GAMMA		VISCOSITY		N/A			
DEPTH-DRILLER		1208 FT.		LEVEL		FULL			
DEPTH-LOGGER		1204 FT.		MAX. REC. TEMP.		32.79 DEG. C			
BTM LOGGED INTERVAL		1204 FT.		IMAGE ORIENTED TO:		N/A			
TOP LOGGED INTERVAL		SURFACE		SAMPLE INTERVAL		0.2 FT			
DRILLER / RIG#		NATIONAL		LOGGING TRUCK		TRUCK #900			
RECORDED BY / Logging Eng.		E. TURNER		TOOL STRING/SN		MSI 60MM SONIC SN 6003			
WITNESSED BY		CHAD/LAUREN - H&A		LOG TIME:ON SITE/OFF SITE		8:00 PM			
RUN BOREHOLE RECORD				CASING RECORD					
NO.		BIT FROM		TO		SIZE		WGT.	
1		? SURFACE		40 FT.		14 IN.		STEEL	
2		12 1/4 IN.		40 FT.		TOTAL DEPTH			
3									
COMMENTS:									

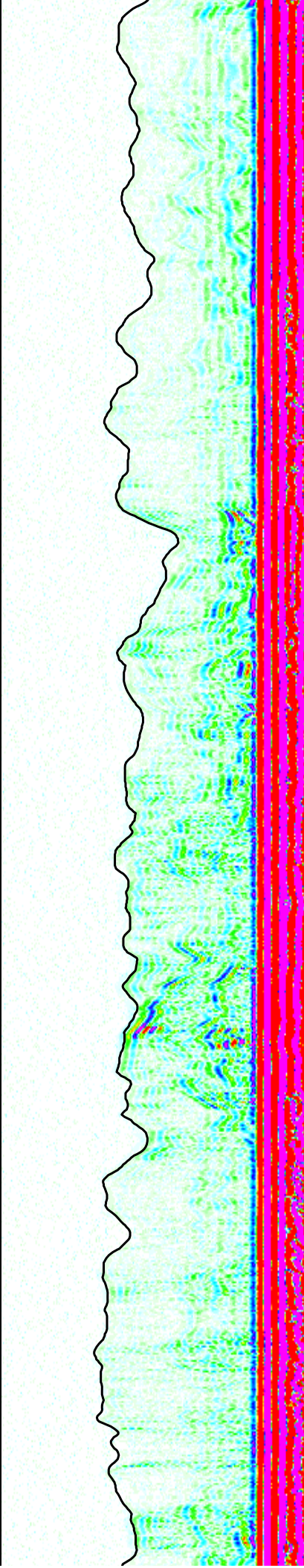
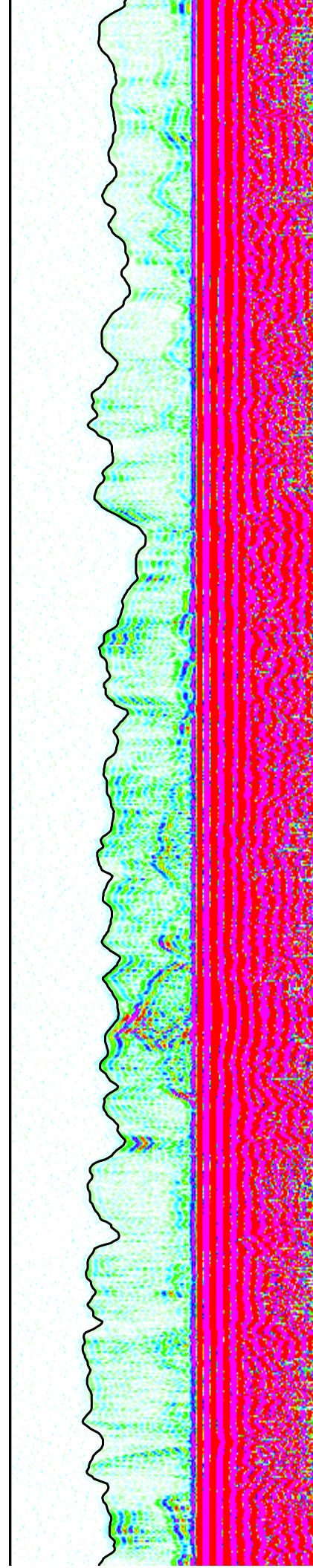
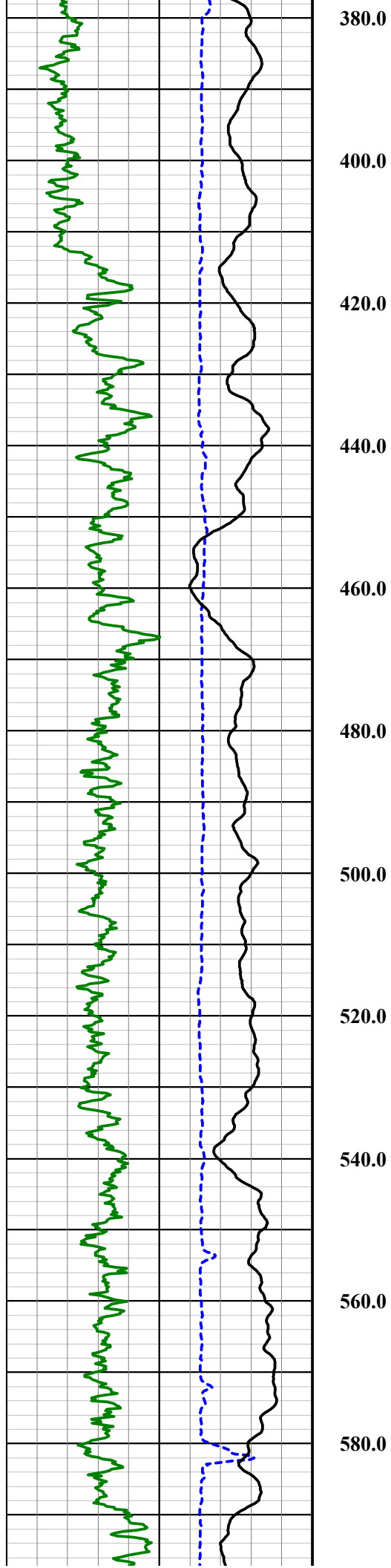
Tool Summary:					
Date	5-5-17	Date	5-5-17	Date	5-5-17
Run No.	1	Run No.	2	Run No.	3
Tool Model	MSI COMBO TOOL	Tool Model	MSI E-LOG 40 GRP	Tool Model	MSI 60MM SONIC
Tool SN	4183	Tool SN	5019	Tool SN	6003
From	SURFACE	From	SURFACE	From	SURFACE
To	1204 FT.	To	1204 FT.	To	1204 FT.
Recorded By	E. TURNER	Recorded By	E. TURNER	Recorded By	E. TURNER
Truck No	900	Truck No	900	Truck No	900
Operation Check	5-4-17	Operation Check	5-4-17	Operation Check	5-4-17
Calibration Check	5-4-17	Calibration Check	5-4-17	Calibration Check	N/A
Time Logged	9:00 PM	Time Logged	10:25 PM	Time Logged	11:25 PM
Date	5-5-17	Date		Date	
Run No.	4	Run No.	5	Run No.	6
Tool Model	MSI 2DVA	Tool Model		Tool Model	
Tool SN	3082	Tool SN		Tool SN	
From	SURFACE	From		From	
To	1204 FT	To		To	
Recorded By	E. TURNER	Recorded By		Recorded By	
Truck No	900	Truck No		Truck No	
Operation Check	5-4-17	Operation Check		Operation Check	
Calibration Check	N/A	Calibration Check		Calibration Check	
Time Logged	12:30 AM	Time Logged		Time Logged	
Additional Comments:					
Caliper Arms Used: 15 IN.		Calibration Points: 6 IN. & 24 IN.			

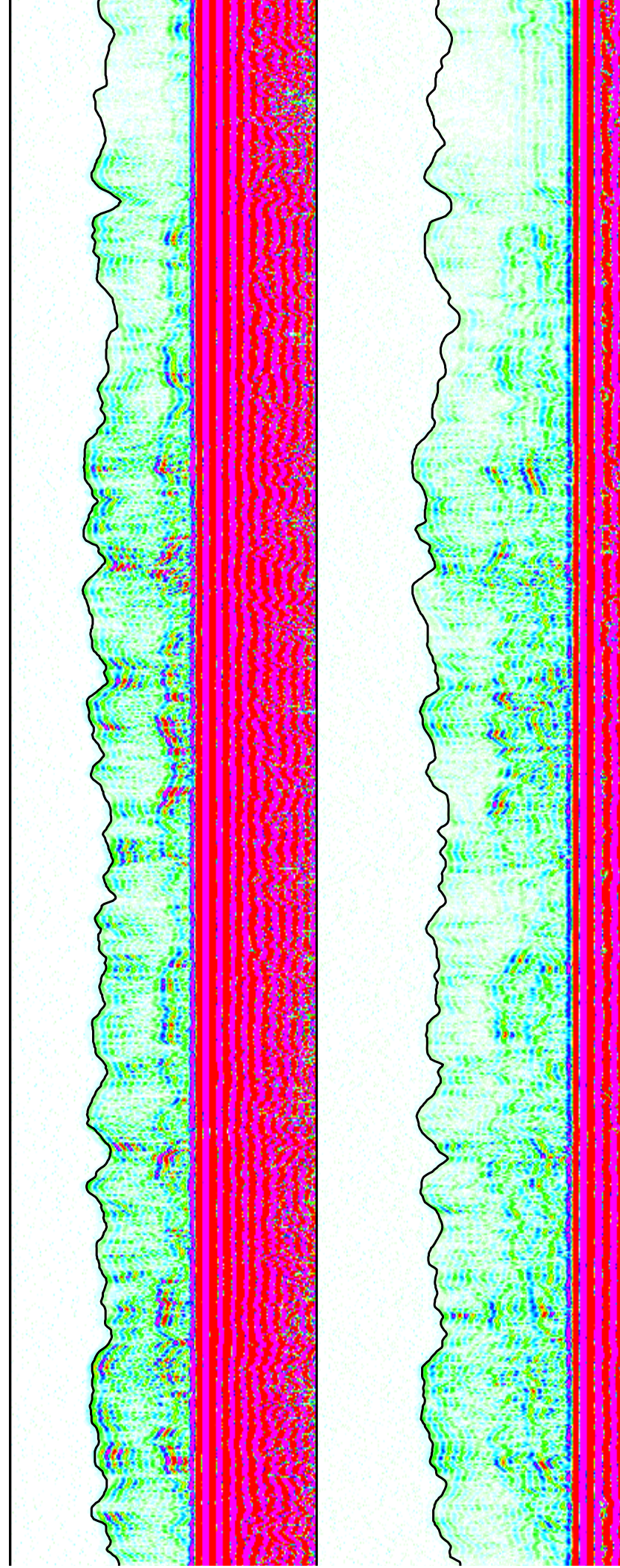
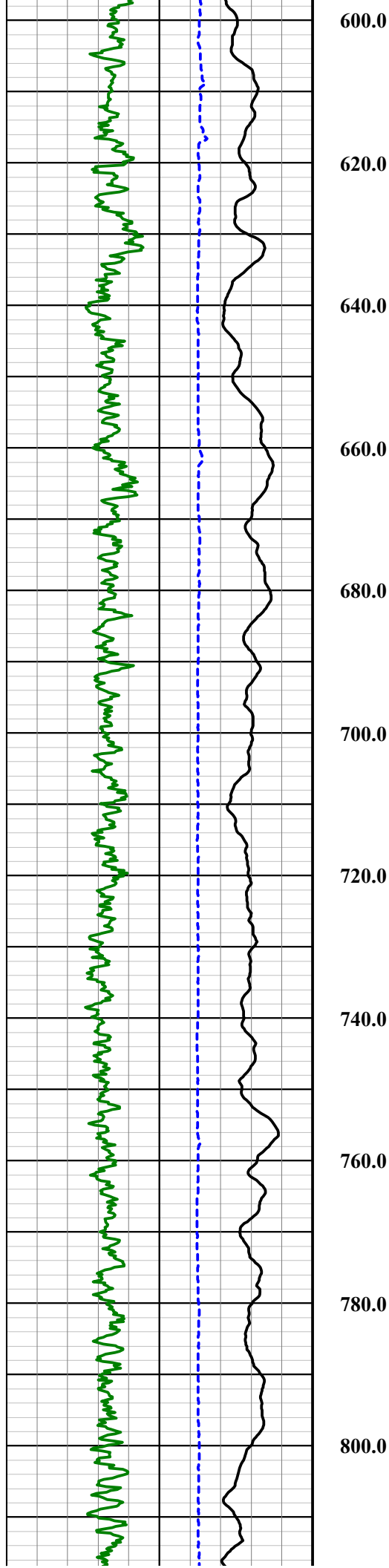
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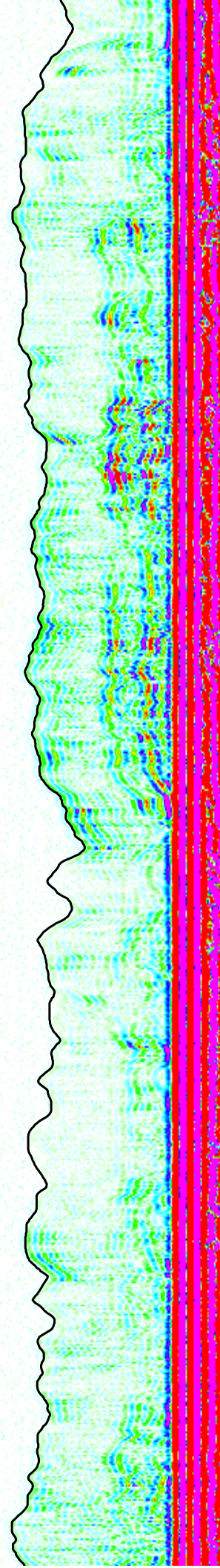
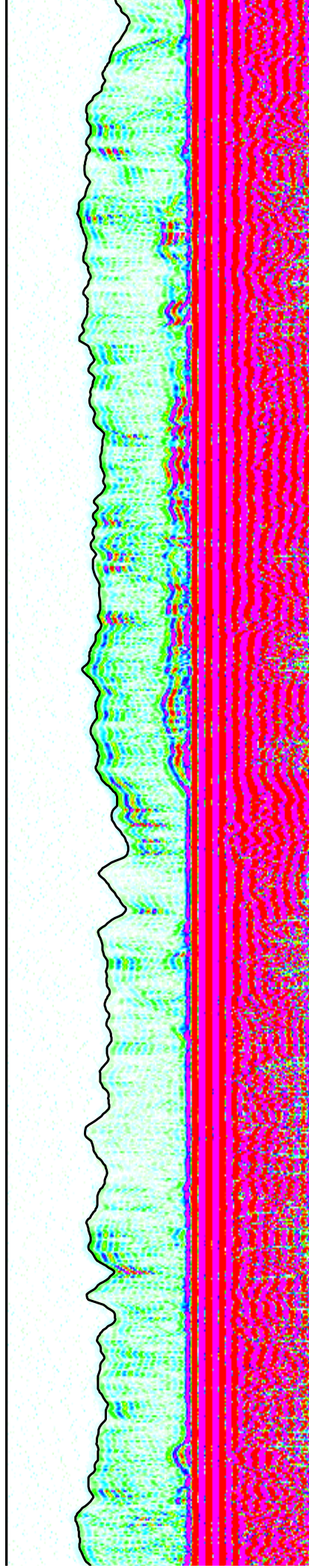
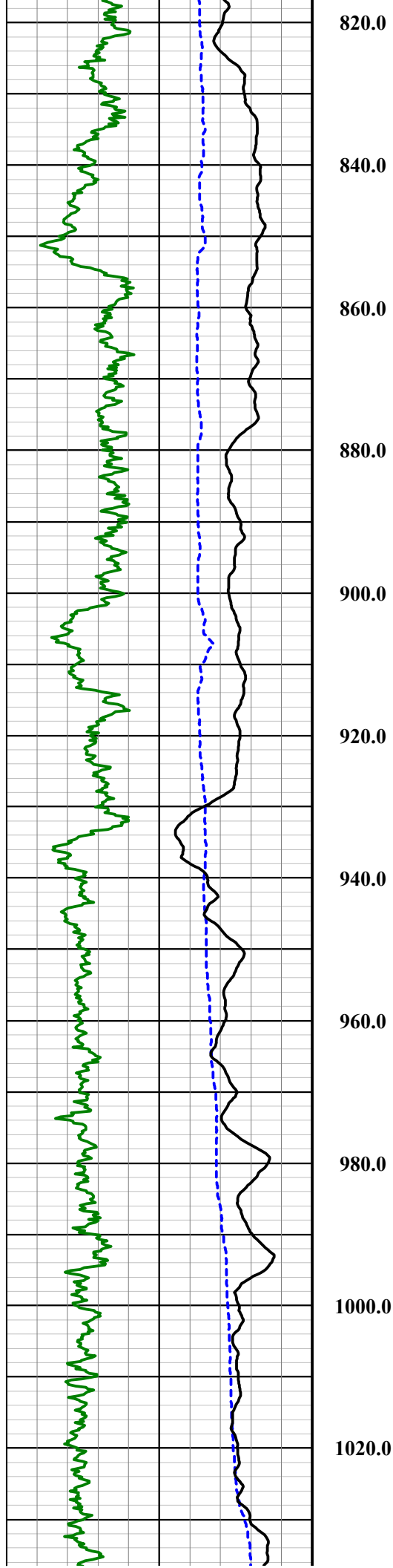
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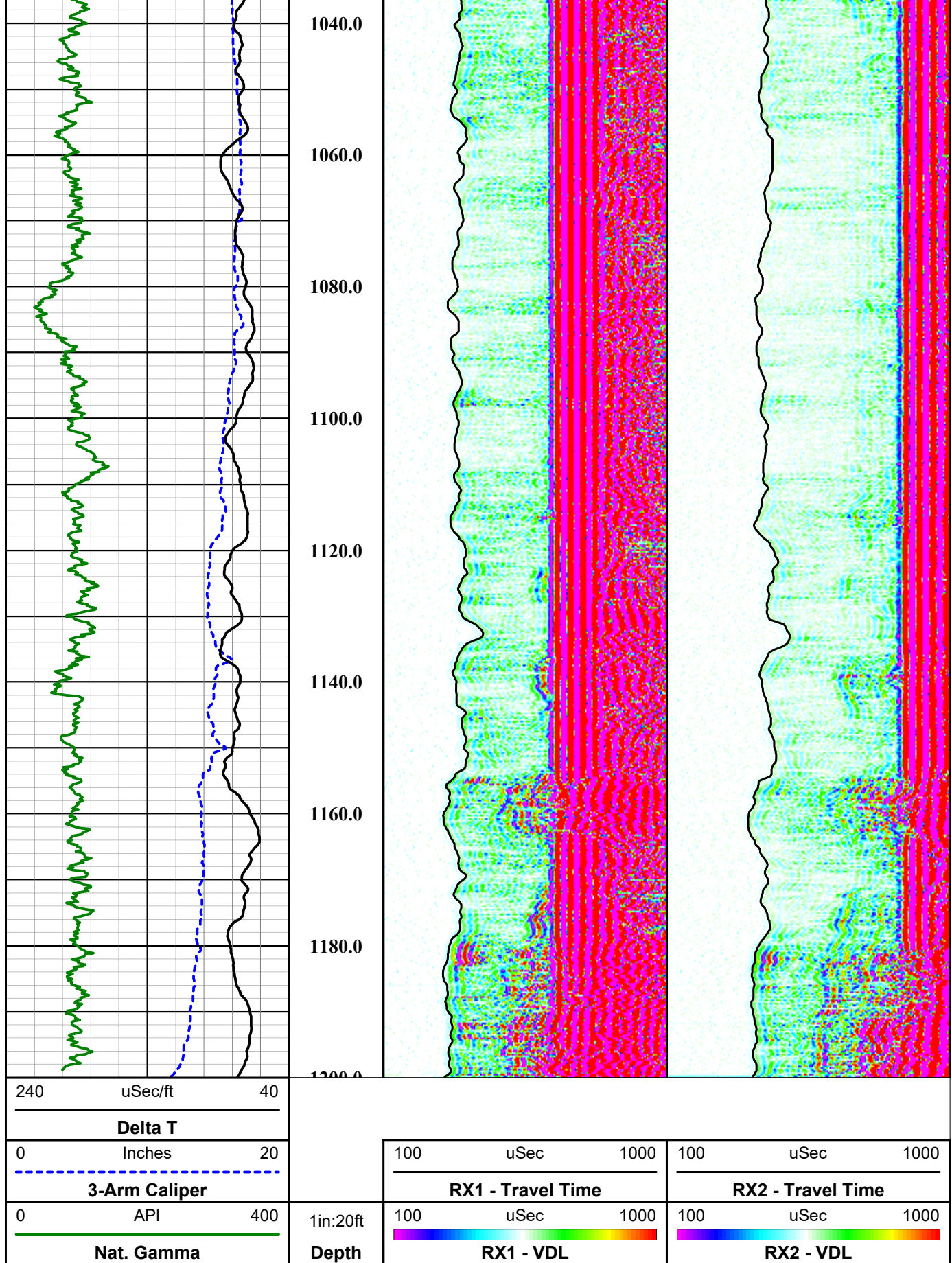












MSI 60 mm 2 RX Full Waveform Sonic Tool

Probe Top = Depth Ref.

Tool SN: 5001, 5050 & 6003



Four Conductor MSI Probe Top

Probe Length = 2.8 m or 9.19 ft

Probe Weight = ~26.5 kg or 58.4 lbs

Sensors: Ceramic Piezoelectric

Transmitter Frequency: 24 - 28 kHz resonant frequency

Rx - Rx Spacing: 0.3 m (12.0 in)

Typically centralized with external centralizers

Can only be collected in fluid

Temperature Rating: 80 Deg C (176 Deg F)

Pressure Rating: 200 bar (2900 psi)

Rx-2 Tx - Rx2 Spacing = 1.22 m (48.0 in)

Rx-1 Tx - Rx1 Spacing = .91 m (36.0 in)

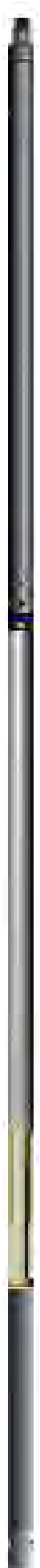
Acoustic Isolater

Tx = Acoustic Transmitter

0.660 m or 26.0 in. - End of tool to center of Tx

2.36 in or 60 mm Diameter

Probe Top = Depth Ref.



Single Conductor MSI Probe Top

Probe Length = 2.59 m or 8.5 ft

Probe Weight = 6.80 kg or 15.0 lbs

Natural Gamma and Caliper can only be collected logging up hole.

Fluid Temperature/Resistivity can only be collected logging down hole.

Temperature Rating: 70 Deg C (158 Deg F)

Pressure Rating: 200 bar (2900 psi)

Natural Gamma Ray = 0.76 m (29.75 in)

NOTE: Lengths on a particular tool may vary from those listed on this document due to probe sizes and styles utilized

3-Arm Caliper = 1.44 m (56.75 in)

Distance from tool top: 2.20 m (86.5 in)

Available Arm Sizes: 3", 9", and 15"

TFR (Temperature/Fluid Resistivity) = 0.39 m (15.5 in)

1.375" or 34.9 mm Diameter



**Southwest Exploration
Services, LLC**

borehole geophysics & video services

Company

FLORENCE COPPER

Well

O-03

Field

FLORENCE COPPER

County

PINAL

State

ARIZONA

Final

Sonic Summary

Drift Report

Wellbore DRIFT Interpretation

PREPARED ESPECIALLY FOR

FLORENCE COPPER

M59-0

Monday - March 27, 2017



This Wellbore Interpretation Package represents our best efforts to provide a correct interpretation. Nevertheless, since all interpretations are opinions based on inferences from electrical or other types of measurements, we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by Customer resulting from any interpretation made by this document. We do not warrant or guarantee the accuracy of the data, specifically including (but without limitations) the accuracy of data transmitted by electronic process, and we will not be responsible for accidental or intentional interception of such data by third parties. Our employees are not empowered to change or otherwise modify the attached interpretation. Furthermore, along with Eagle Pro Software we do not warrant or guarantee the accuracy of the programming techniques employed to produce this document. By accepting this Interpretation Package, the Customer agrees to the foregoing, and to our General Terms and Conditions.

Southwest Exploration Services, LLC
(480) 926-4558

WELLBORE DRIFT INTERPRETATION

Southwest Exploration Services, LLC

(480) 926-4558

Company:	FLORENCE COPPER			Well Owner:								
County:	PINAL	State:	Arizona		Country:	USA						
Well Number:	M59-0	Survey Date:	Monday - March 27, 2017		Magnetic Declination:	Declination Correction Not Used						
Field:	FLORENCE COPPER		Drift Calculation Methodology:			Balanced Tangential Method						
Location:												
Remarks:												
Witness:	BRANDON - H&A	Vehicle No.:	900	Invoice No.:		Operator:	E, TURNER	Well Depth:	1206 Feet	Casing size:	10.625 Inches	
Tool:	Compass - 6002		Lat.:		Long.:		Sec.:		Twp.:		Rge.:	

MEASURED DATA			DATA COMPUTATIONS						
DEPTHS, feet	INCLINATIONS, degrees	AZIMUTHS, degrees	TVD, feet	T. LATITUDE, feet	T. LONGITUDE, feet	DOGLEG SEV., degrees per 20 Feet	DOGLEG SEV., degrees per 100 feet	DRIFT DIST., feet	DRIFT BGR., degrees
20	0.30	157.96	20.00						
40	0.24	152.54	39.99	-0.086	0.039	0.42	0.26	0.09' (1.08")	155.60
60	0.22	071.60	59.98	-0.111	0.095	0.96	3.63	0.15' (1.80")	139.50
80	0.22	105.12	79.97	-0.109	0.169	0.84	1.61	0.20' (2.40")	122.90
100	0.21	123.73	99.97	-0.139	0.237	0.42	0.90	0.27' (3.24")	120.50
120	0.16	175.27	119.96	-0.187	0.270	0.14	2.43	0.33' (3.96")	124.80
140	0.18	200.34	139.95	-0.244	0.261	0.43	1.21	0.36' (4.32")	133.10
160	0.13	274.74	159.94	-0.272	0.227	0.83	3.38	0.35' (4.20")	140.10
180	0.33	204.91	179.93	-0.322	0.180	0.95	3.20	0.37' (4.44")	150.80
200	0.21	096.18	199.92	-0.378	0.192	0.38	4.54	0.42' (5.04")	153.10
220	0.28	106.25	219.91	-0.396	0.275	1.00	0.49	0.48' (5.76")	145.20
240	0.31	026.24	239.90	-0.361	0.346	1.00	3.59	0.50' (6.00")	136.20
260	0.43	031.63	259.89	-0.249	0.409	0.35	0.26	0.48' (5.76")	121.30
280	0.32	040.24	279.88	-0.142	0.484	0.93	0.42	0.50' (6.00")	106.40
300	0.38	041.02	299.87	-0.049	0.564	0.79	0.04	0.57' (6.84")	095.00
320	0.31	040.12	319.86	0.042	0.642	0.51	0.04	0.64' (7.68")	086.20
340	0.35	067.89	339.85	0.106	0.733	0.01	1.34	0.74' (8.88")	081.70
360	0.44	056.28	359.84	0.172	0.853	0.54	0.57	0.87' (10.44")	078.60

Page No. 1

True Vertical Depth: 1199.43'

Final Drift Distance: 2.23' (26.76")

Final Drift Bearing: 107.80°

Note: Magnetic Declination is not used because it is not a factor in the calculation of well drift or alignment. Magnetic Declination is only important if attempting to hit a target or miss another well and then it is included in the calculations.

WELLBORE DRIFT INTERPRETATION

Southwest Exploration Services, LLC

(480) 926-4558

M59-0

MEASURED DATA			DATA COMPUTATIONS						
DEPTHS, feet	INCLINATIONS, degrees	AZIMUTHS, degrees	TVD, feet	T. LATITUDE, feet	T. LONGITUDE, feet	DOGLEG SEV., degrees per 20 Feet	DOGLEG SEV., degrees per 100 feet	DRIFT DIST., feet	DRIFT BRG., degrees
380	0.39°	047.24°	379.83	0.261	0.967	0.74	0.44	1.00' (12.00")	074.90
400	0.51°	040.83°	399.82	0.375	1.075	0.89	0.31	1.14' (13.68")	070.80
420	0.22°	081.52°	419.81	0.448	1.171	0.22	1.94	1.25' (15.00")	069.10
440	0.23°	136.60°	439.80	0.424	1.237	0.97	2.58	1.31' (15.72")	071.10
460	0.17°	197.82°	459.79	0.367	1.256	0.97	2.85	1.31' (15.72")	073.70
480	0.05°	186.58°	479.78	0.330	1.246	0.15	0.55	1.29' (15.48")	075.20
500	0.33°	134.13°	499.77	0.281	1.286	0.83	2.47	1.32' (15.84")	077.70
520	0.10°	210.78°	519.76	0.226	1.318	0.61	3.47	1.34' (16.08")	080.30
540	0.07°	173.96°	539.75	0.199	1.310	0.71	1.77	1.33' (15.96")	081.40
560	0.15°	171.33°	559.74	0.161	1.315	0.25	0.13	1.33' (15.96")	083.00
580	0.07°	199.92°	579.73	0.124	1.315	0.76	1.38	1.32' (15.84")	084.60
600	0.10°	193.24°	599.72	0.096	1.307	0.51	0.33	1.31' (15.72")	085.80
620	0.10°	284.76°	619.71	0.083	1.286	0.71	4.00	1.29' (15.48")	086.30
640	0.29°	186.05°	639.70	0.037	1.264	0.10	4.24	1.26' (15.12")	088.30
660	0.17°	256.70°	659.69	-0.020	1.230	0.84	3.23	1.23' (14.76")	090.90
680	0.07°	249.61°	679.68	-0.031	1.190	0.82	0.35	1.19' (14.28")	091.50
700	0.20°	139.26°	699.67	-0.062	1.201	0.21	4.59	1.20' (14.40")	092.90
720	0.24°	208.27°	719.66	-0.125	1.204	0.57	3.17	1.21' (14.52")	095.90
740	0.28°	137.92°	739.65	-0.198	1.217	0.27	3.22	1.23' (14.76")	099.20
760	0.17°	328.56°	759.64	-0.209	1.234	0.93	5.57	1.25' (15.00")	099.60
780	0.29°	281.11°	779.63	-0.174	1.169	0.62	2.25	1.18' (14.16")	098.50
800	0.12°	238.34°	799.62	-0.175	1.102	0.96	2.04	1.12' (13.44")	099.00
820	0.19°	309.60°	819.61	-0.165	1.059	0.10	3.26	1.07' (12.84")	098.90
840	0.19°	317.36°	839.60	-0.119	1.011	0.33	0.38	1.02' (12.24")	096.70
860	0.26°	146.78°	859.59	-0.133	1.013	0.54	5.57	1.02' (12.24")	097.50
880	0.31°	222.71°	879.58	-0.211	1.001	0.50	3.44	1.02' (12.24")	101.90
900	0.19°	308.80°	899.57	-0.230	0.938	0.46	3.82	0.97' (11.64")	103.80
920	0.22°	247.71°	919.56	-0.224	0.877	0.66	2.84	0.90' (10.80")	104.30
940	0.32°	210.66°	939.55	-0.287	0.813	0.09	1.78	0.86' (10.32")	109.40
960	0.46°	199.36°	959.54	-0.411	0.758	0.25	0.55	0.86' (10.32")	118.50
980	0.57°	126.32°	979.53	-0.546	0.812	0.99	3.33	0.98' (11.76")	123.90
1,000	0.52°	211.14°	999.53	-0.683	0.845	0.93	3.77	1.09' (13.08")	128.90
1,020	0.40°	073.21°	1,019.52	-0.741	0.865	0.97	5.22	1.14' (13.68")	130.60
Page No. 2			True Vertical Depth: <u>1199.43'</u>			Final Drift Distance: <u>2.23'</u> (26.76")		Final Drift Bearing: <u>107.80°</u>	

(480) 926-4558

[illegible]

Final Drift Bearing: 107.80°

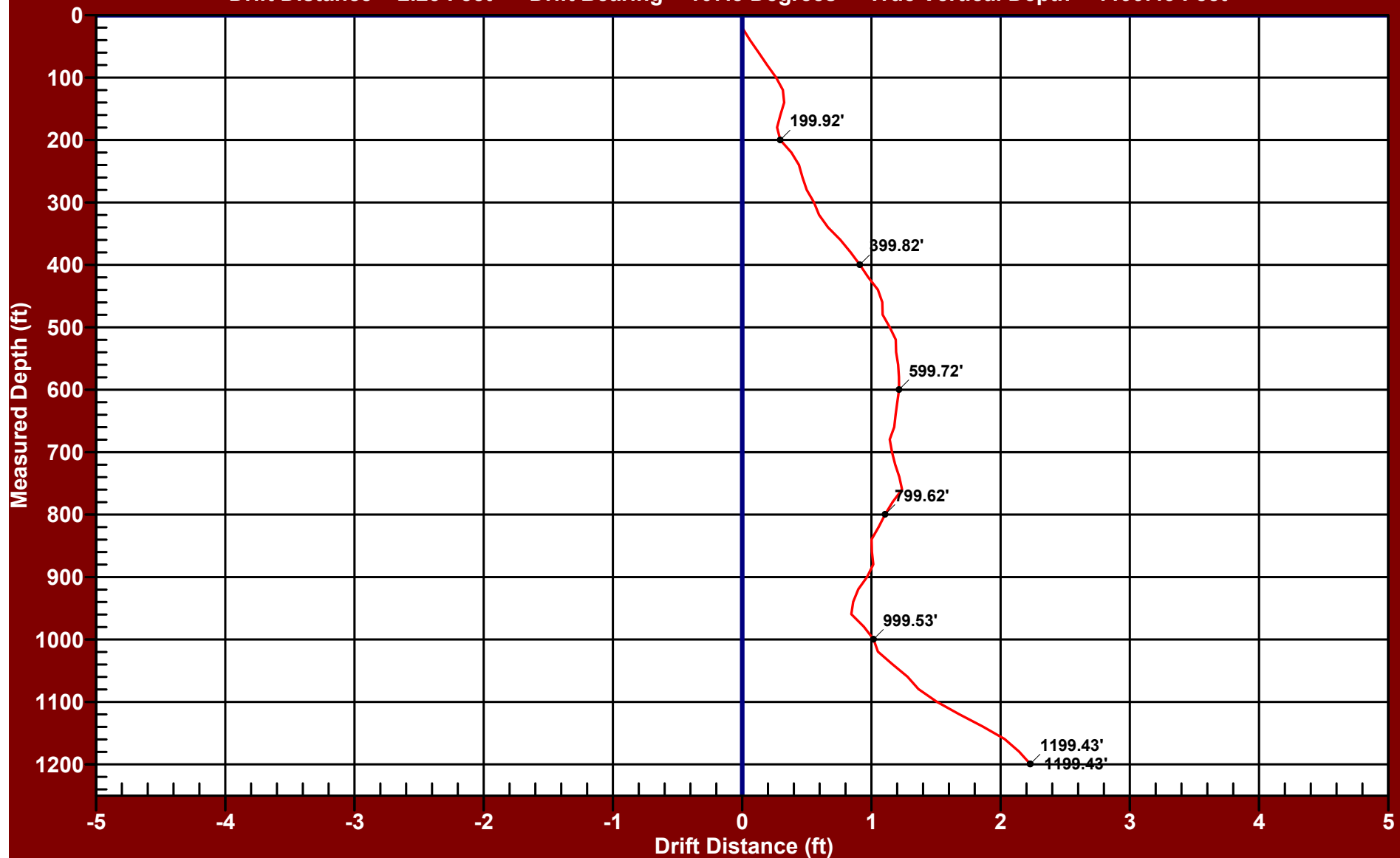
PLANE OF DRIFT VIEW - M59-0

FLORENCE COPPER

Drift Distance = 2.23 Feet

Drift Bearing = 107.8 Degrees

True Vertical Depth = 1199.43 Feet



Date of Survey: Monday - March 27, 2017

Balanced Tangential Calculation Method

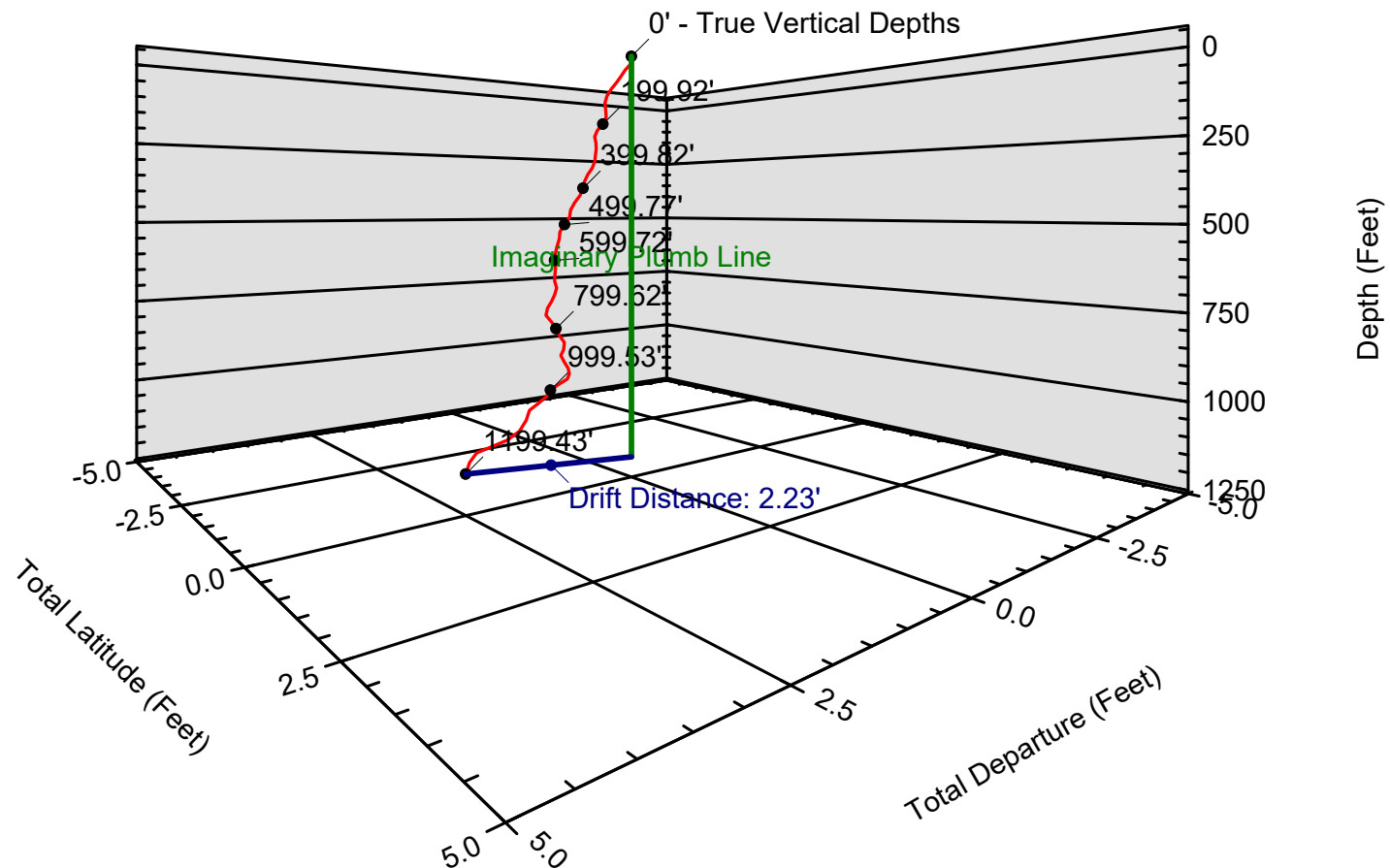
Southwest Exploration Services, LLC (480) 926-4558

3D PROJECTION VIEW - M59-0

FLORENCE COPPER

Drift Distance = 2.23 Feet Drift Bearing = 107.8 Degrees True Vertical Depth = 1199.43 Feet

321.0



Date of Survey: Monday - March 27, 2017

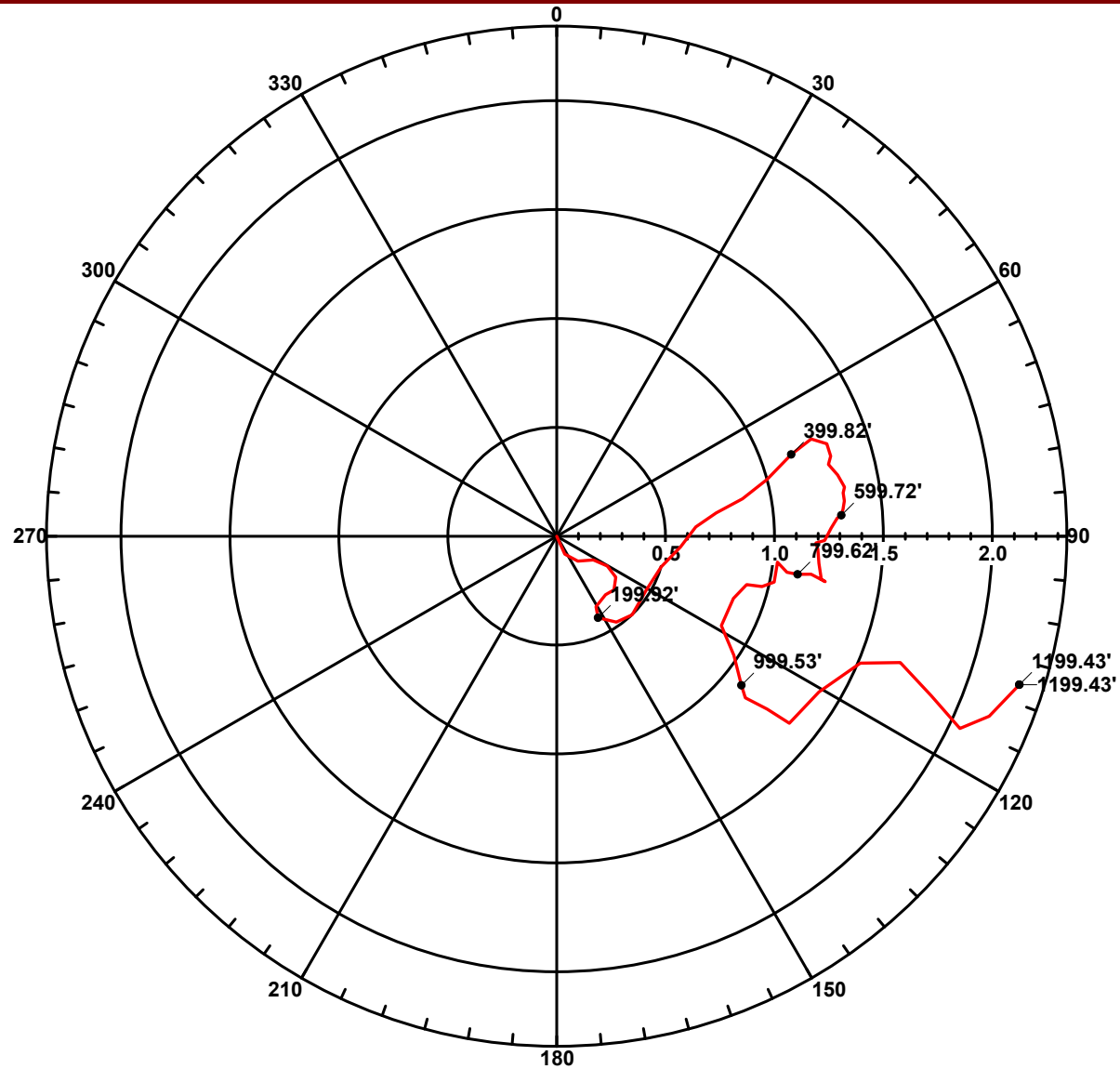
Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

POLAR VIEW - M59-0

FLORENCE COPPER

Drift Distance = 2.23 Feet Drift Bearing = 107.8 Degrees True Vertical Depth = 1199.43 Feet



Date of Survey: Monday - March 27, 2017

Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

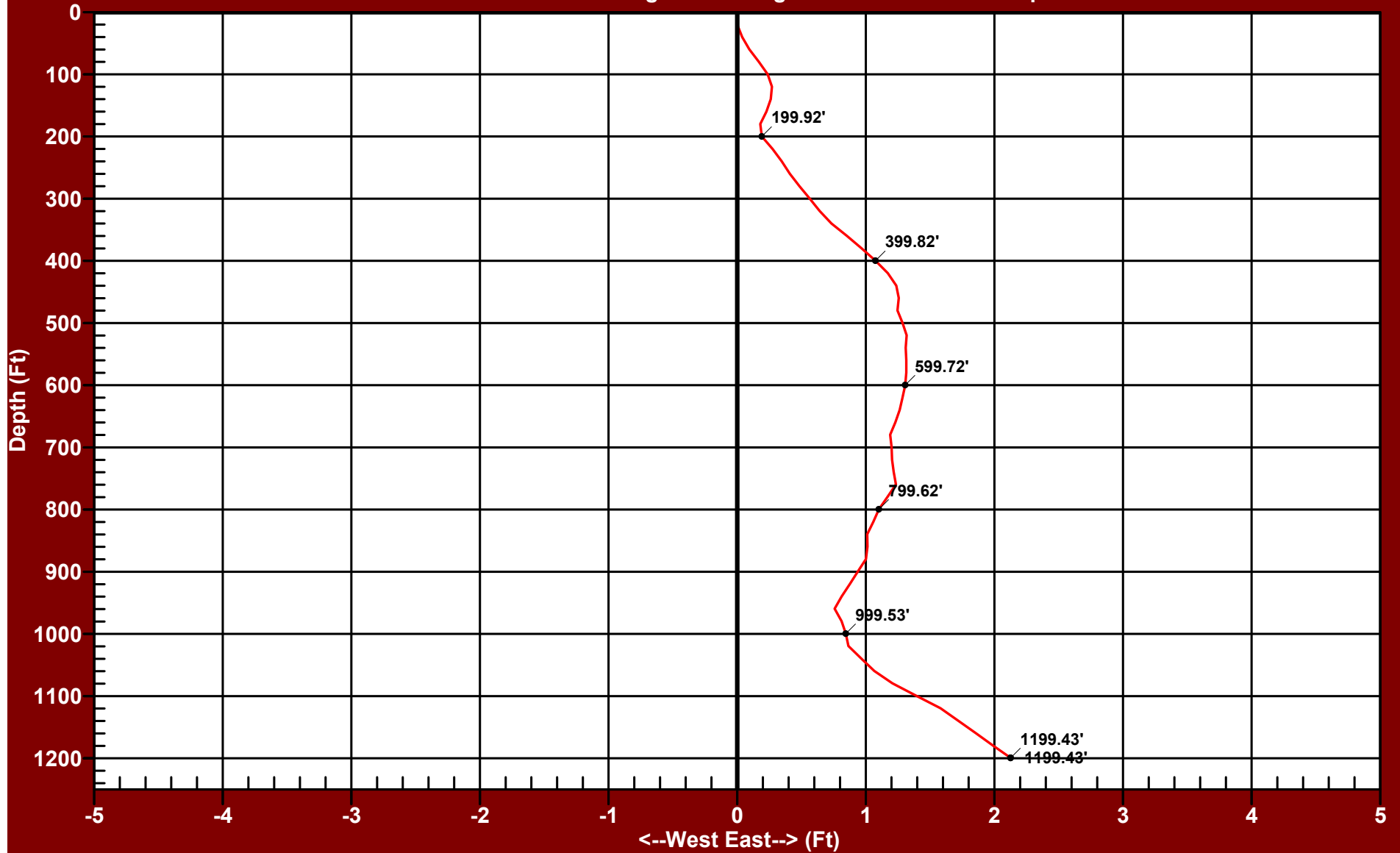
EASTING RECTANGULAR VIEW - M59-0

FLORENCE COPPER

Drift Distance = 2.23 Feet

Drift Bearing = 107.8 Degrees

True Vertical Depth = 1199.43 Feet



Date of Survey: Monday - March 27, 2017

Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

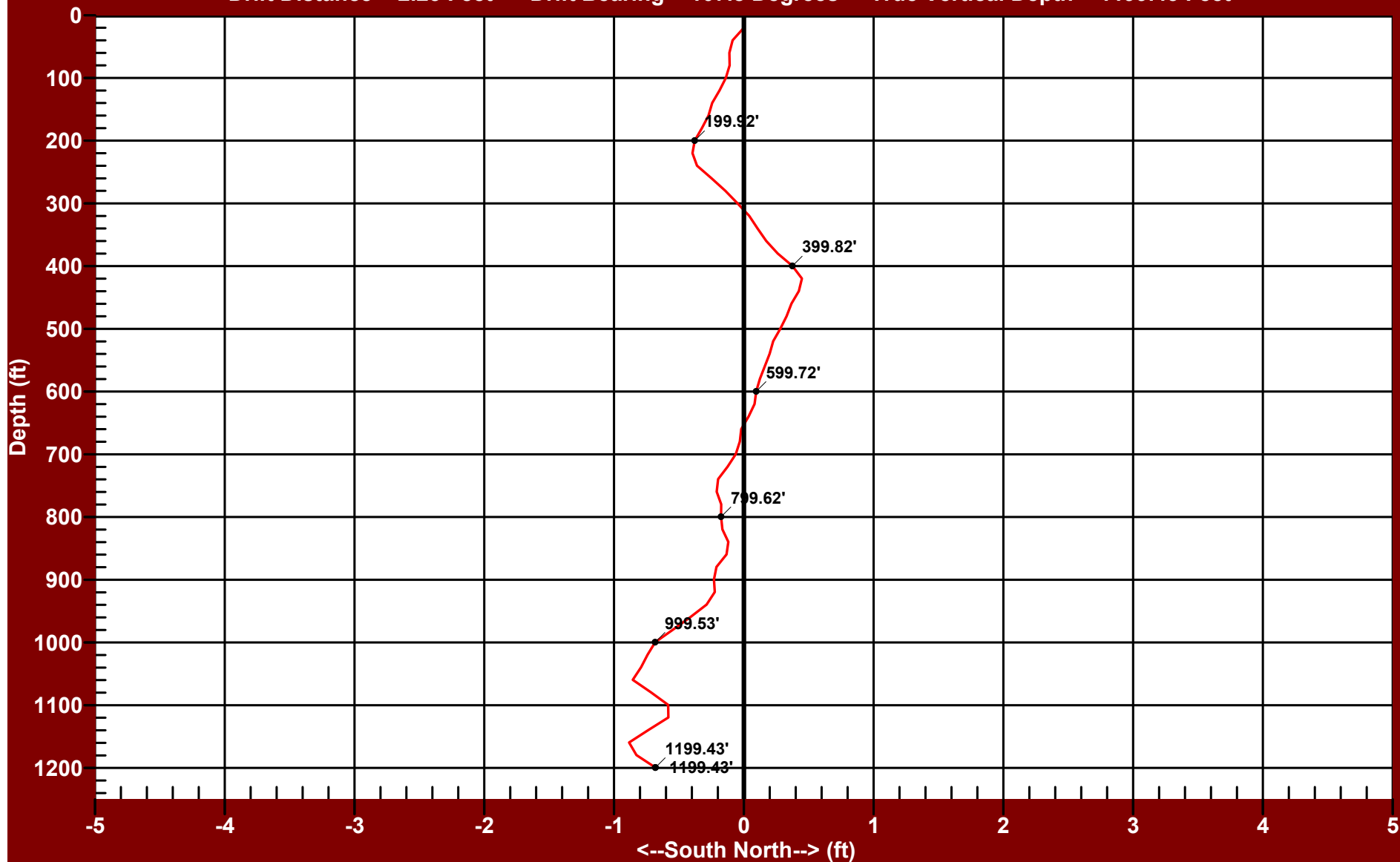
NORTHING RECTANGULAR VIEW - M59-0

FLORENCE COPPER

Drift Distance = 2.23 Feet

Drift Bearing = 107.8 Degrees

True Vertical Depth = 1199.43 Feet



Date of Survey: Monday - March 27, 2017

Balanced Tangential Calculation Method

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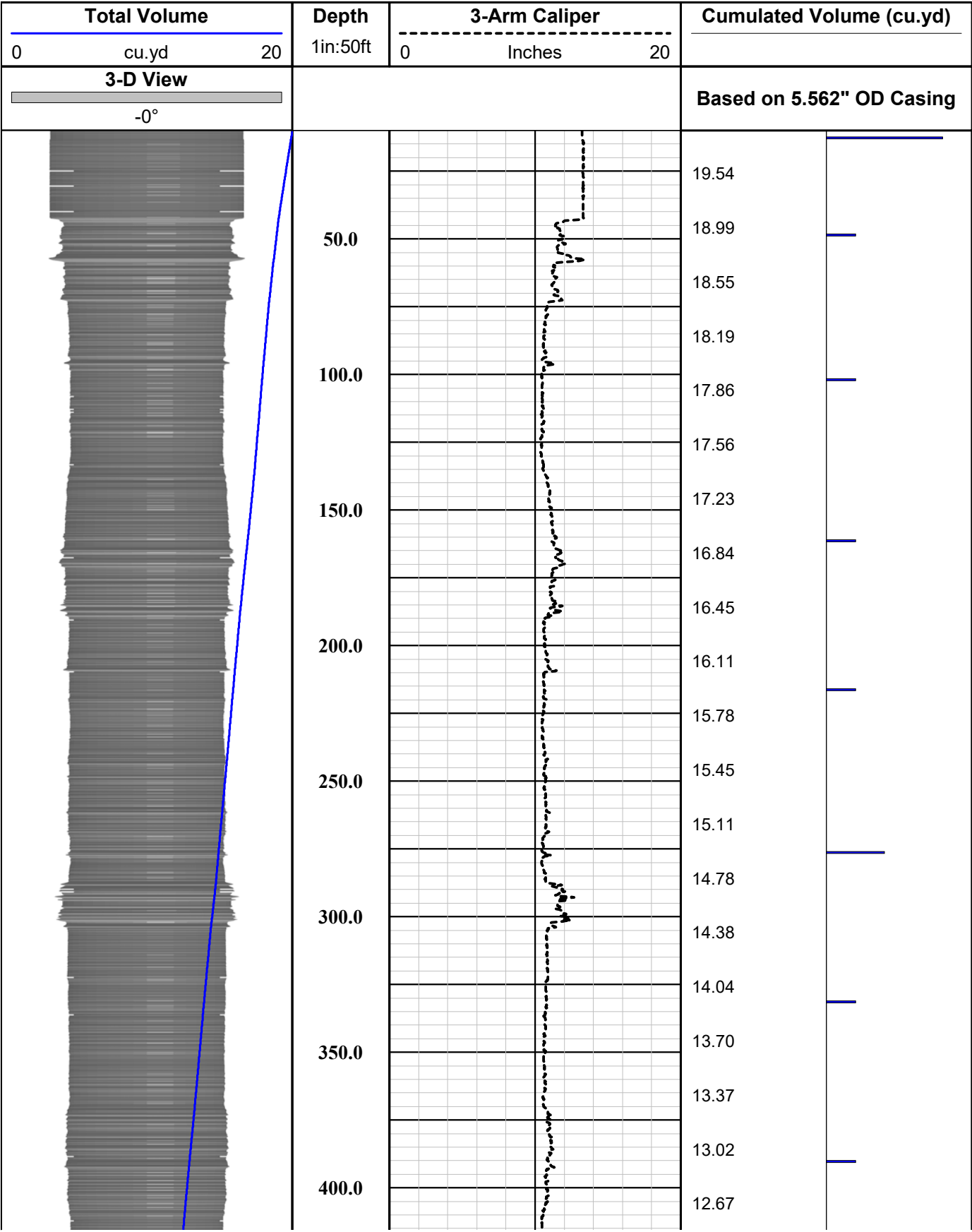
Southwest Exploration Services, LLC

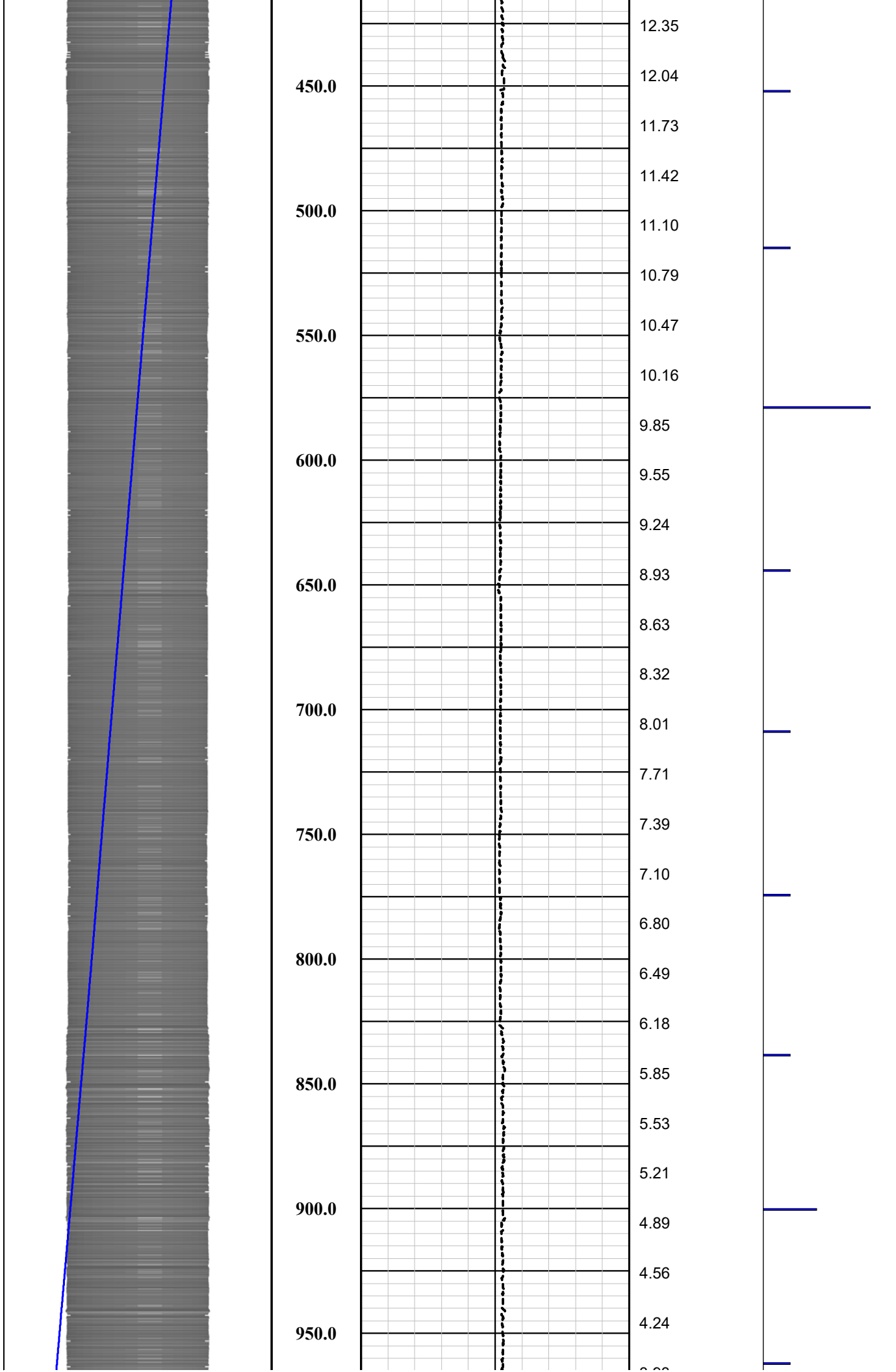
borehole geophysics & video services

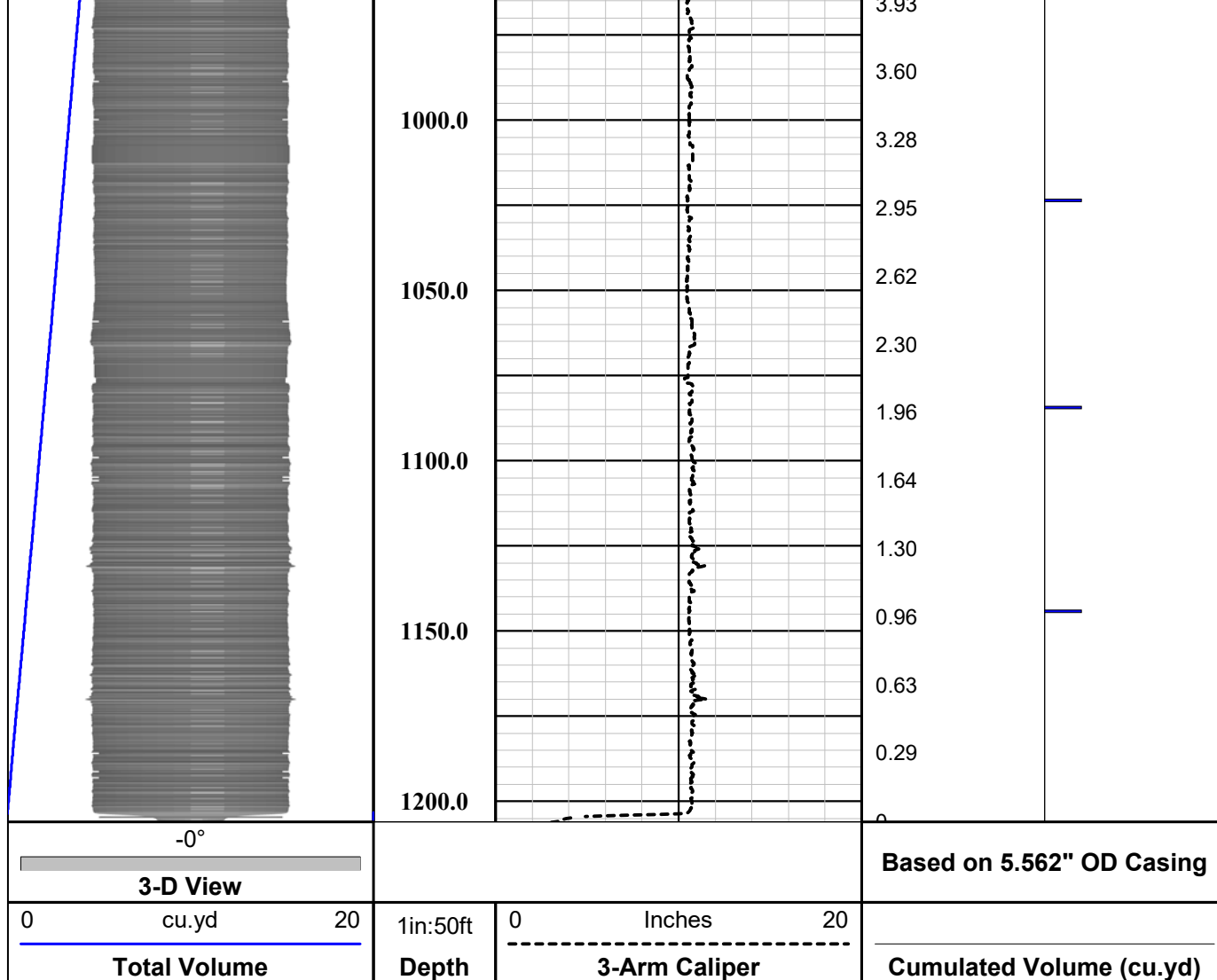
COMPANY FLORENCE COPPER									
WELL ID M59-0									
FIELD FLORENCE COPPER									
COUNTY PINAL									
STATE ARIZONA									
TYPE OF LOGS: 3-ARM CALIPER									
MORE: W/ VOLUME									
LOCATION									
OTHER SERVICES									
E-LOGS									
SONIC									
DEVIATION									
NAT. GAMMA									
TEMPERATURE									
FLUID RES.									
SEC TWP RGE									
PERMANENT DATUM									
ELEVATION									
LOG MEAS. FROM GROUND LEVEL									
ABOVE PERM. DATUM									
D.F.									
DRILLING MEAS. FROM GROUND LEVEL									
G.L.									
DATE									
3-27-17									
MUD									
RUN No									
1									
MUD WEIGHT									
N/A									
TYPE LOG									
CALIPER									
N/A									
DEPTH-DRILLER									
1210 FT.									
LEVEL									
FULL									
DEPTH-LOGGER									
1206 FT.									
MAX. REC. TEMP.									
34.4 DEG. C									
BTM LOGGED INTERVAL									
1206 FT.									
IMAGE ORIENTED TO:									
N/A									
TOP LOGGED INTERVAL									
SURFACE									
SAMPLE INTERVAL									
0.1 FT									
DRILLER / RIG#									
NATIONAL									
LOGGING TRUCK									
TRUCK #900									
RECORDED BY / Logging Eng.									
E. TURNER									
TOOL STRING/SN									
MSI COMBO TOOL 4183									
WITNESSED BY									
NATIONAL									
LOG TIME:ON SITE/OFF SITE									
2:00 PM									
RUN									
BOREHOLE RECORD									
CASING RECORD									
NO.									
BIT									
FROM									
TO									
SIZE									
WGT.									
FROM									
TO									
1									
?									
SURFACE									
40 FT.									
STEEL									
SURFACE									
40 FT.									
2									
10 5/8 IN.									
40 FT.									
TOTAL DEPTH									
3									
COMMENTS:									

Disclaimer:

All interpretations of log data are opinions based on inferences from electrical or other measurements. We do not guarantee the accuracy or correctness of any interpretations or recommendations and shall not be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our employees or agents. These interpretations are also subject to our general terms and conditions set out in our current Service Invoice.

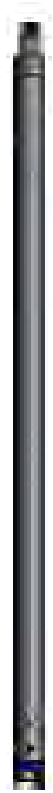






MSI Gamma-Caliper-Temperature-Fluid Resistivity

Probe Top = Depth Ref.



Single Conductor MSI Probe Top

Probe Length = 2.59 m or 8.5 ft

Probe Weight = 6.80 kg or 15.0 lbs

Natural Gamma and Caliper can only be collected logging up hole.

Fluid Temperature/Resistivity can only be collected logging down hole.

Temperature Rating: 70 Deg C (158 Deg F)

Pressure Rating: 200 bar (2900 psi)

Natural Gamma Ray = 0.76 m (29.75 in)

NOTE: Lengths on a particular tool may vary from those listed on this document due to probe sizes and styles utilized



————— **3-Arm Caliper = 1.44 m (56.75 in)**

Distance from tool top: 2.20 m (86.5 in)

Available Arm Sizes: 3", 9", and 15"

————— **TFR (Temperature/Fluid Resistivity) = 0.39 m (15.5 in)**

1.375" or 34.9 mm Diameter



**Southwest Exploration
Services, LLC**

borehole geophysics & video services

Company FLORENCE COPPER

Well M59-0

Field FLORENCE COPPER

County PINAL

State ARIZONA

Preliminary

3-arm Caliper w/ Volume Summary

APPENDIX F

SAPT Documentation

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
STANDARD ANNULAR PRESSURE TEST

Operator FLORENCE COPPER, INC

State Permit No. P-101704

Address 1575 W. HUNT HWY

USEPA Permit No. R9UIC-AZ3-FY11-1

FLORENCE, AZ 85132

Date of Test 6/13/2017

Well Name M59-O

Well Type CLASS III SUPPL. MONITORING

LOCATION INFORMATION

SW Quarter of the NE Quarter of the SW Quarter of Section 28; Range 9E; Township 4S; County PINAL;

Company Representative IAN REAM; Field Inspector LAUREN CANDREVA;

Type of Pressure Gauge Pressure transducer with data logger inch face; 300 psi full scale; 0.001 psi increments;

New Gauge? Yes ☒ No ☐ If no, date of calibration _____ Calibration certification submitted? Yes ☐ No ☒

TEST RESULTS

Readings must be taken at least every 10 minutes for a minimum of 30 minutes for Class II, III and V wells and 60 minutes for Class I wells.

For Class II wells, annulus pressure should be at least 300 psig. For Class I wells, annulus pressure should be the greater of 300 psig or 100 psi above maximum permitted injection pressure.

Original chart recordings must be submitted with this form.

5-year or annual test on time? Yes ☐ No ☒

2-year test for TA'd wells on time? Yes ☐ No ☒

After rework? Yes ☐ No ☒

Newly permitted well? Yes ☒ No ☐

Time	Pressure (in psig)	
	Annulus	Tubing
14:25	114.30	same
14:35	113.86	same
14:45	113.17	same
14:55	112.80	same

Casing size 5" - NOMINAL

Tubing size 2"

Packer type INFLATABLE PACKER

Packer set @ 504.15

Top of Permitted Injection Zone 505 feet

Is packer 100 ft or less above top of

Injection Zone? Yes ☒ No ☐

If not, please submit a justification.

Fluid return (gal.) 7.95

Comments: Pressure data collected by Level TROLL 400
Monitoring well outside of planned injection and recovery zone.

Test Pressures: Max. Allowable Pressure Change: Initial test pressure x 0.05 5.72 psi

Test Period Pressure change 1.80 psi

Test Passed ☒ Test Failed ☐

If failed test, well must be shut in, no injection can occur, and USEPA must be contacted within 24 hours. Corrective action needs to occur, the well retested, and written authorization received before injection can recommence.

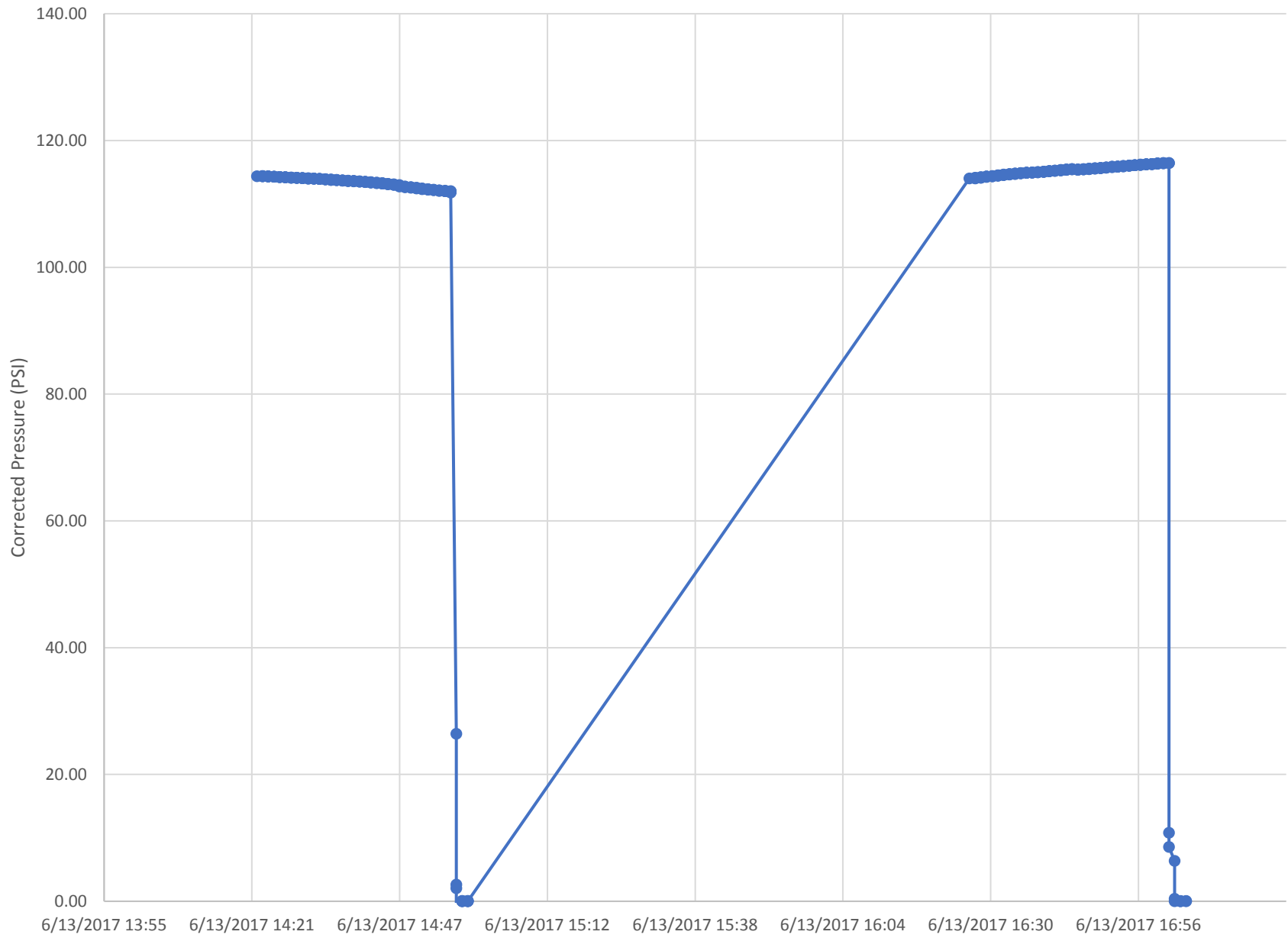
I certify under penalty of law that this document and all attachments are, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. (See 40 CFR 144.32(d))

Ian Ream
Printed Name of Company Representative

[Signature]
Signature of Company Representative

6-14-2018
Date

M59-O Standard Annular Pressure Test Data



Well M59-O SAPT Data		
Tranducer Serial Number:	519257	
Tranducer Model:	Level TROLL 400 non-vented 300 psi	
Date and Time	Pressure (PSI)	Corrected Presssure (PSI) (Sensor pressure - barometric pressure)
6/13/2017 14:22	128.18	114.37
6/13/2017 14:23	128.20	114.39
6/13/2017 14:23	128.20	114.38
6/13/2017 14:23	128.17	114.35
6/13/2017 14:23	128.18	114.36
6/13/2017 14:24	128.19	114.38
6/13/2017 14:24	128.14	114.33
6/13/2017 14:24	128.14	114.32
6/13/2017 14:24	128.13	114.31
6/13/2017 14:25	128.11	114.30
6/13/2017 14:25	128.11	114.30
6/13/2017 14:25	128.11	114.30
6/13/2017 14:25	128.11	114.29
6/13/2017 14:26	128.07	114.25
6/13/2017 14:26	128.07	114.26
6/13/2017 14:26	128.07	114.25
6/13/2017 14:26	128.04	114.23
6/13/2017 14:27	128.04	114.23
6/13/2017 14:27	128.02	114.21
6/13/2017 14:27	128.00	114.19
6/13/2017 14:27	128.03	114.21
6/13/2017 14:28	127.98	114.16
6/13/2017 14:28	127.95	114.14
6/13/2017 14:28	127.95	114.13
6/13/2017 14:28	127.94	114.12
6/13/2017 14:29	127.94	114.13
6/13/2017 14:29	127.92	114.11
6/13/2017 14:29	127.93	114.11
6/13/2017 14:29	127.90	114.08
6/13/2017 14:30	127.90	114.09
6/13/2017 14:30	127.87	114.05
6/13/2017 14:30	127.87	114.05
6/13/2017 14:30	127.88	114.06
6/13/2017 14:31	127.85	114.04
6/13/2017 14:31	127.82	114.00
6/13/2017 14:31	127.84	114.02
6/13/2017 14:31	127.81	113.99
6/13/2017 14:32	127.832	114.02
6/13/2017 14:32	127.796	113.98
6/13/2017 14:32	127.795	113.98

Well M59-O SAPT Data		
Tranducer Serial Number:	519257	
Tranducer Model:	Level TROLL 400 non-vented 300 psi	
Date and Time	Pressure (PSI)	Corrected Presssure (PSI) (Sensor pressure - barometric pressure)
6/13/2017 14:32	127.782	113.97
6/13/2017 14:33	127.762	113.95
6/13/2017 14:33	127.763	113.95
6/13/2017 14:33	127.756	113.94
6/13/2017 14:33	127.752	113.94
6/13/2017 14:34	127.731	113.91
6/13/2017 14:34	127.714	113.90
6/13/2017 14:34	127.695	113.88
6/13/2017 14:34	127.692	113.88
6/13/2017 14:35	127.672	113.86
6/13/2017 14:35	127.618	113.80
6/13/2017 14:35	127.619	113.80
6/13/2017 14:35	127.619	113.80
6/13/2017 14:36	127.594	113.78
6/13/2017 14:36	127.583	113.77
6/13/2017 14:36	127.584	113.77
6/13/2017 14:36	127.56	113.74
6/13/2017 14:37	127.54	113.72
6/13/2017 14:37	127.51	113.69
6/13/2017 14:37	127.498	113.68
6/13/2017 14:37	127.477	113.66
6/13/2017 14:38	127.481	113.66
6/13/2017 14:38	127.467	113.65
6/13/2017 14:38	127.441	113.62
6/13/2017 14:38	127.42	113.60
6/13/2017 14:39	127.44	113.62
6/13/2017 14:39	127.415	113.60
6/13/2017 14:39	127.393	113.58
6/13/2017 14:39	127.385	113.57
6/13/2017 14:40	127.372	113.56
6/13/2017 14:40	127.36	113.54
6/13/2017 14:40	127.348	113.53
6/13/2017 14:40	127.35	113.53
6/13/2017 14:41	127.31	113.49
6/13/2017 14:41	127.30	113.48
6/13/2017 14:41	127.28	113.47
6/13/2017 14:41	127.26	113.44
6/13/2017 14:42	127.25	113.43
6/13/2017 14:42	127.21	113.39
6/13/2017 14:42	127.22	113.41

Well M59-O SAPT Data		
Tranducer Serial Number:	519257	
Tranducer Model:	Level TROLL 400 non-vented 300 psi	
Date and Time	Pressure (PSI)	Corrected Presssure (PSI) (Sensor pressure - barometric pressure)
6/13/2017 14:42	127.19	113.37
6/13/2017 14:43	127.17	113.35
6/13/2017 14:43	127.16	113.34
6/13/2017 14:43	127.10	113.29
6/13/2017 14:43	127.11	113.29
6/13/2017 14:44	127.11	113.29
6/13/2017 14:44	127.05	113.23
6/13/2017 14:44	127.04	113.22
6/13/2017 14:44	127.03	113.21
6/13/2017 14:45	126.99	113.17
6/13/2017 14:45	126.95	113.14
6/13/2017 14:45	126.96	113.15
6/13/2017 14:45	126.92	113.10
6/13/2017 14:46	126.91	113.09
6/13/2017 14:46	126.85	113.04
6/13/2017 14:46	126.85	113.03
6/13/2017 14:46	126.82	113.00
6/13/2017 14:47	126.81	112.99
6/13/2017 14:47	126.71	112.90
6/13/2017 14:47	126.67	112.85
6/13/2017 14:47	126.57	112.76
6/13/2017 14:48	126.53	112.72
6/13/2017 14:48	126.56	112.74
6/13/2017 14:48	126.49	112.68
6/13/2017 14:48	126.46	112.65
6/13/2017 14:49	126.45	112.64
6/13/2017 14:49	126.43	112.61
6/13/2017 14:49	126.39	112.57
6/13/2017 14:49	126.36	112.55
6/13/2017 14:50	126.36	112.55
6/13/2017 14:50	126.33	112.52
6/13/2017 14:50	126.30	112.48
6/13/2017 14:50	126.27	112.46
6/13/2017 14:51	126.25	112.44
6/13/2017 14:51	126.23	112.41
6/13/2017 14:51	126.20	112.38
6/13/2017 14:51	126.15	112.33
6/13/2017 14:52	126.15	112.33
6/13/2017 14:52	126.11	112.29
6/13/2017 14:52	126.11	112.29

Well M59-O SAPT Data		
Tranducer Serial Number:	519257	
Tranducer Model:	Level TROLL 400 non-vented 300 psi	
Date and Time	Pressure (PSI)	Corrected Presssure (PSI) (Sensor pressure - barometric pressure)
6/13/2017 14:52	126.05	112.24
6/13/2017 14:53	126.06	112.25
6/13/2017 14:53	126.04	112.22
6/13/2017 14:53	126.03	112.21
6/13/2017 14:53	125.98	112.16
6/13/2017 14:54	125.94	112.12
6/13/2017 14:54	125.95	112.14
6/13/2017 14:54	125.92	112.10
6/13/2017 14:54	125.88	112.06
6/13/2017 14:55	125.89	112.08
6/13/2017 14:55	125.84	112.03
6/13/2017 14:55	125.84	112.02
6/13/2017 14:55	125.83	112.02
6/13/2017 14:56	125.81	111.99
6/13/2017 14:56	125.79	111.97
6/13/2017 14:56	125.73	111.92
6/13/2017 14:56	125.58	111.77
6/13/2017 14:57	40.23	26.42
6/13/2017 14:57	16.44	2.62
6/13/2017 14:57	15.87	2.05
6/13/2017 14:57	13.30	-0.52
6/13/2017 14:58	13.829	0.01
6/13/2017 14:58	13.864	0.05
6/13/2017 14:58	13.835	0.02
6/13/2017 14:58	13.863	0.05
6/13/2017 14:59	13.84	0.02
6/13/2017 14:59	13.871	0.05
6/13/2017 14:59	13.882	0.06
6/13/2017 14:59	13.817	0.00
6/13/2017 16:27	127.842	114.03
6/13/2017 16:28	127.842	114.03
6/13/2017 16:28	127.876	114.06
6/13/2017 16:28	127.903	114.09
6/13/2017 16:28	127.959	114.14
6/13/2017 16:29	127.95	114.13
6/13/2017 16:29	127.957	114.14
6/13/2017 16:29	128.011	114.19
6/13/2017 16:29	128.024	114.21
6/13/2017 16:30	128.065	114.25
6/13/2017 16:30	128.092	114.28

Well M59-O SAPT Data		
Tranducer Serial Number:	519257	
Tranducer Model:	Level TROLL 400 non-vented 300 psi	
Date and Time	Pressure (PSI)	Corrected Presssure (PSI) (Sensor pressure - barometric pressure)
6/13/2017 16:30	128.137	114.32
6/13/2017 16:30	128.151	114.33
6/13/2017 16:31	128.173	114.36
6/13/2017 16:31	128.2	114.38
6/13/2017 16:31	128.189	114.37
6/13/2017 16:31	128.229	114.41
6/13/2017 16:32	128.271	114.45
6/13/2017 16:32	128.289	114.47
6/13/2017 16:32	128.307	114.49
6/13/2017 16:32	128.337	114.52
6/13/2017 16:33	128.358	114.54
6/13/2017 16:33	128.381	114.56
6/13/2017 16:33	128.415	114.60
6/13/2017 16:33	128.439	114.62
6/13/2017 16:34	128.464	114.65
6/13/2017 16:34	128.494	114.68
6/13/2017 16:34	128.501	114.68
6/13/2017 16:34	128.521	114.70
6/13/2017 16:35	128.544	114.73
6/13/2017 16:35	128.582	114.77
6/13/2017 16:35	128.596	114.78
6/13/2017 16:35	128.602	114.79
6/13/2017 16:36	128.639	114.82
6/13/2017 16:36	128.641	114.82
6/13/2017 16:36	128.675	114.86
6/13/2017 16:36	128.67	114.85
6/13/2017 16:37	128.717	114.90
6/13/2017 16:37	128.734	114.92
6/13/2017 16:37	128.74	114.92
6/13/2017 16:37	128.738	114.92
6/13/2017 16:38	128.749	114.93
6/13/2017 16:38	128.762	114.95
6/13/2017 16:38	128.756	114.94
6/13/2017 16:38	128.754	114.94
6/13/2017 16:39	128.805	114.99
6/13/2017 16:39	128.802	114.99
6/13/2017 16:39	128.849	115.03
6/13/2017 16:39	128.846	115.03
6/13/2017 16:40	128.869	115.05
6/13/2017 16:40	128.882	115.07

Well M59-O SAPT Data		
Tranducer Serial Number:	519257	
Tranducer Model:	Level TROLL 400 non-vented 300 psi	
Date and Time	Pressure (PSI)	Corrected Presssure (PSI) (Sensor pressure - barometric pressure)
6/13/2017 16:40	128.892	115.08
6/13/2017 16:40	128.904	115.09
6/13/2017 16:41	128.969	115.15
6/13/2017 16:41	128.982	115.17
6/13/2017 16:41	128.99	115.17
6/13/2017 16:41	128.992	115.18
6/13/2017 16:42	129.065	115.25
6/13/2017 16:42	129.034	115.22
6/13/2017 16:42	129.047	115.23
6/13/2017 16:42	129.082	115.27
6/13/2017 16:43	129.1	115.28
6/13/2017 16:43	129.111	115.29
6/13/2017 16:43	129.129	115.31
6/13/2017 16:43	129.202	115.39
6/13/2017 16:44	129.169	115.35
6/13/2017 16:44	129.202	115.39
6/13/2017 16:44	129.222	115.41
6/13/2017 16:44	129.244	115.43
6/13/2017 16:45	129.287	115.47
6/13/2017 16:45	129.265	115.45
6/13/2017 16:45	129.287	115.47
6/13/2017 16:45	129.29	115.47
6/13/2017 16:46	129.269	115.45
6/13/2017 16:46	129.216	115.40
6/13/2017 16:46	129.184	115.37
6/13/2017 16:46	129.212	115.40
6/13/2017 16:47	129.244	115.43
6/13/2017 16:47	129.262	115.45
6/13/2017 16:47	129.291	115.47
6/13/2017 16:47	129.308	115.49
6/13/2017 16:48	129.305	115.49
6/13/2017 16:48	129.312	115.50
6/13/2017 16:48	129.362	115.55
6/13/2017 16:48	129.361	115.54
6/13/2017 16:49	129.361	115.54
6/13/2017 16:49	129.406	115.59
6/13/2017 16:49	129.422	115.61
6/13/2017 16:49	129.443	115.63
6/13/2017 16:50	129.463	115.65
6/13/2017 16:50	129.454	115.64

Well M59-O SAPT Data		
Tranducer Serial Number:	519257	
Tranducer Model:	Level TROLL 400 non-vented 300 psi	
Date and Time	Pressure (PSI)	Corrected Presssure (PSI) (Sensor pressure - barometric pressure)
6/13/2017 16:50	129.497	115.68
6/13/2017 16:50	129.491	115.67
6/13/2017 16:51	129.53	115.71
6/13/2017 16:51	129.544	115.73
6/13/2017 16:51	129.576	115.76
6/13/2017 16:51	129.583	115.77
6/13/2017 16:52	129.614	115.80
6/13/2017 16:52	129.669	115.85
6/13/2017 16:52	129.656	115.84
6/13/2017 16:52	129.674	115.86
6/13/2017 16:53	129.672	115.86
6/13/2017 16:53	129.698	115.88
6/13/2017 16:53	129.701	115.88
6/13/2017 16:53	129.724	115.91
6/13/2017 16:54	129.741	115.92
6/13/2017 16:54	129.764	115.95
6/13/2017 16:54	129.794	115.98
6/13/2017 16:54	129.797	115.98
6/13/2017 16:55	129.822	116.01
6/13/2017 16:55	129.849	116.03
6/13/2017 16:55	129.844	116.03
6/13/2017 16:55	129.877	116.06
6/13/2017 16:56	129.903	116.09
6/13/2017 16:56	129.913	116.10
6/13/2017 16:56	129.927	116.11
6/13/2017 16:56	129.925	116.11
6/13/2017 16:57	129.958	116.14
6/13/2017 16:57	129.993	116.18
6/13/2017 16:57	129.987	116.17
6/13/2017 16:57	130.026	116.21
6/13/2017 16:58	130.034	116.22
6/13/2017 16:58	130.059	116.24
6/13/2017 16:58	130.056	116.24
6/13/2017 16:58	130.072	116.26
6/13/2017 16:59	130.077	116.26
6/13/2017 16:59	130.096	116.28
6/13/2017 16:59	130.11	116.29
6/13/2017 16:59	130.124	116.31
6/13/2017 17:00	130.154	116.34
6/13/2017 17:00	130.169	116.35

Well M59-O SAPT Data		
Tranducer Serial Number:	519257	
Tranducer Model:	Level TROLL 400 non-vented 300 psi	
Date and Time	Pressure (PSI)	Corrected Presssure (PSI) (Sensor pressure - barometric pressure)
6/13/2017 17:00	130.17	116.35
6/13/2017 17:00	130.21	116.39
6/13/2017 17:01	130.22	116.40
6/13/2017 17:01	130.24	116.43
6/13/2017 17:01	130.27	116.45
6/13/2017 17:01	130.25	116.44
6/13/2017 17:02	130.28	116.46
6/13/2017 17:02	130.28	116.46
6/13/2017 17:02	24.62	10.81
6/13/2017 17:02	22.40	8.58
6/13/2017 17:03	20.20	6.39
6/13/2017 17:03	14.20	0.38
6/13/2017 17:03	13.67	-0.15
6/13/2017 17:03	13.84	0.03
6/13/2017 17:04	13.85	0.03
6/13/2017 17:04	13.81	-0.01
6/13/2017 17:04	13.82	0.00
6/13/2017 17:04	13.84	0.03
6/13/2017 17:05	13.87	0.05
6/13/2017 17:05	13.84	0.02

APPENDIX G

Cement Bond Log Summary

WELL M59-O

Geophysical Log Summary

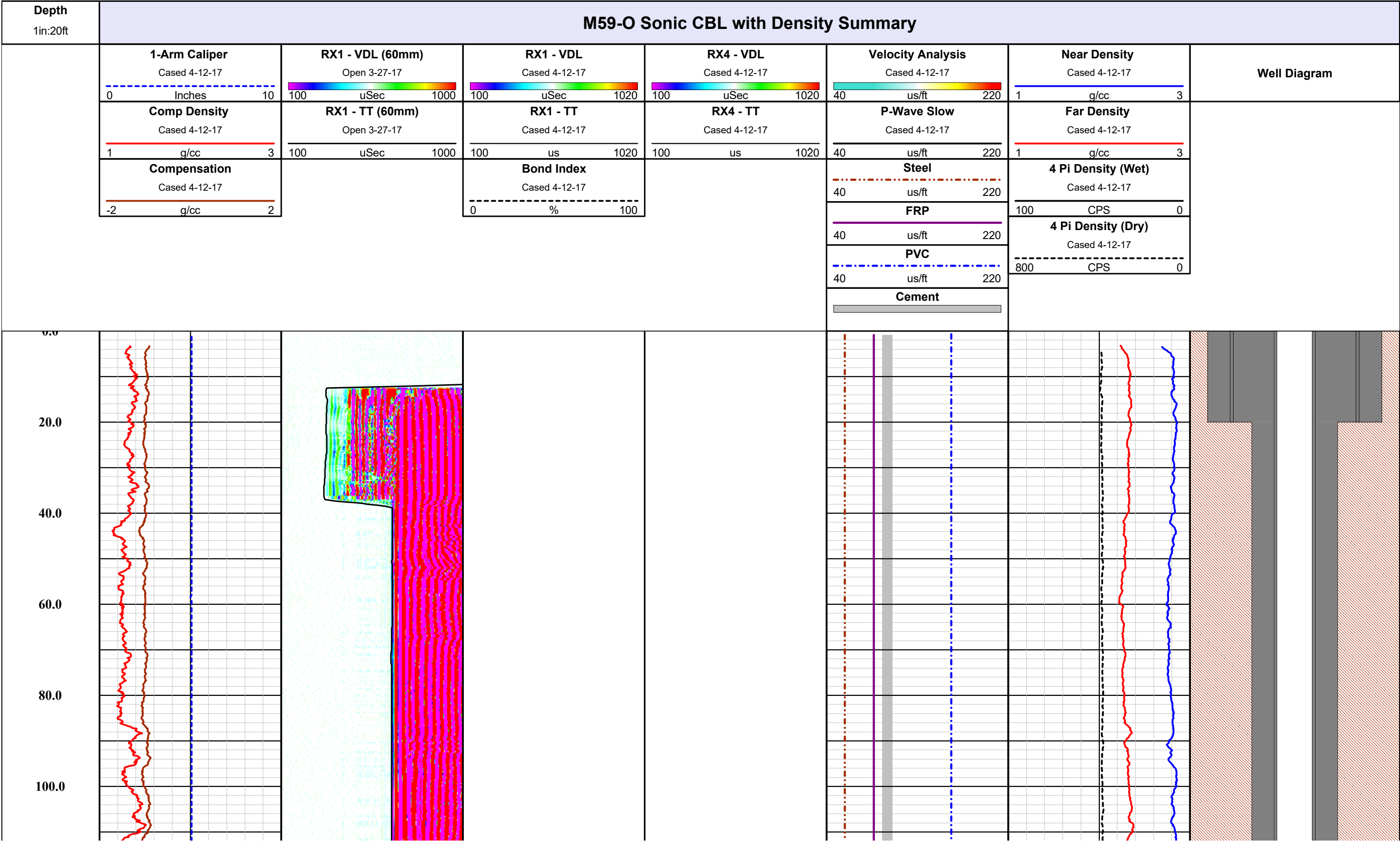


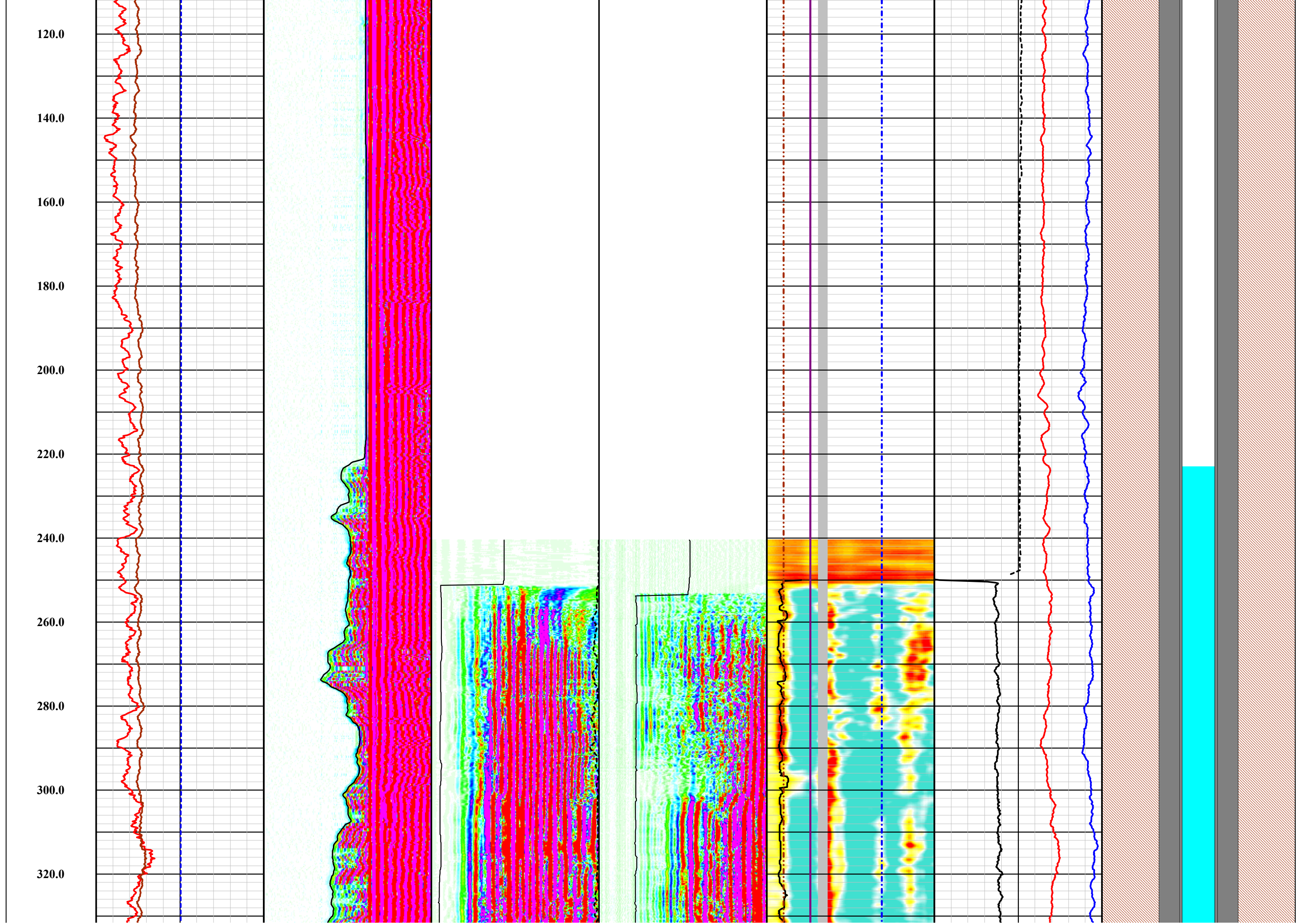
Southwest Exploration Services, LLC
borehole geophysics & video services

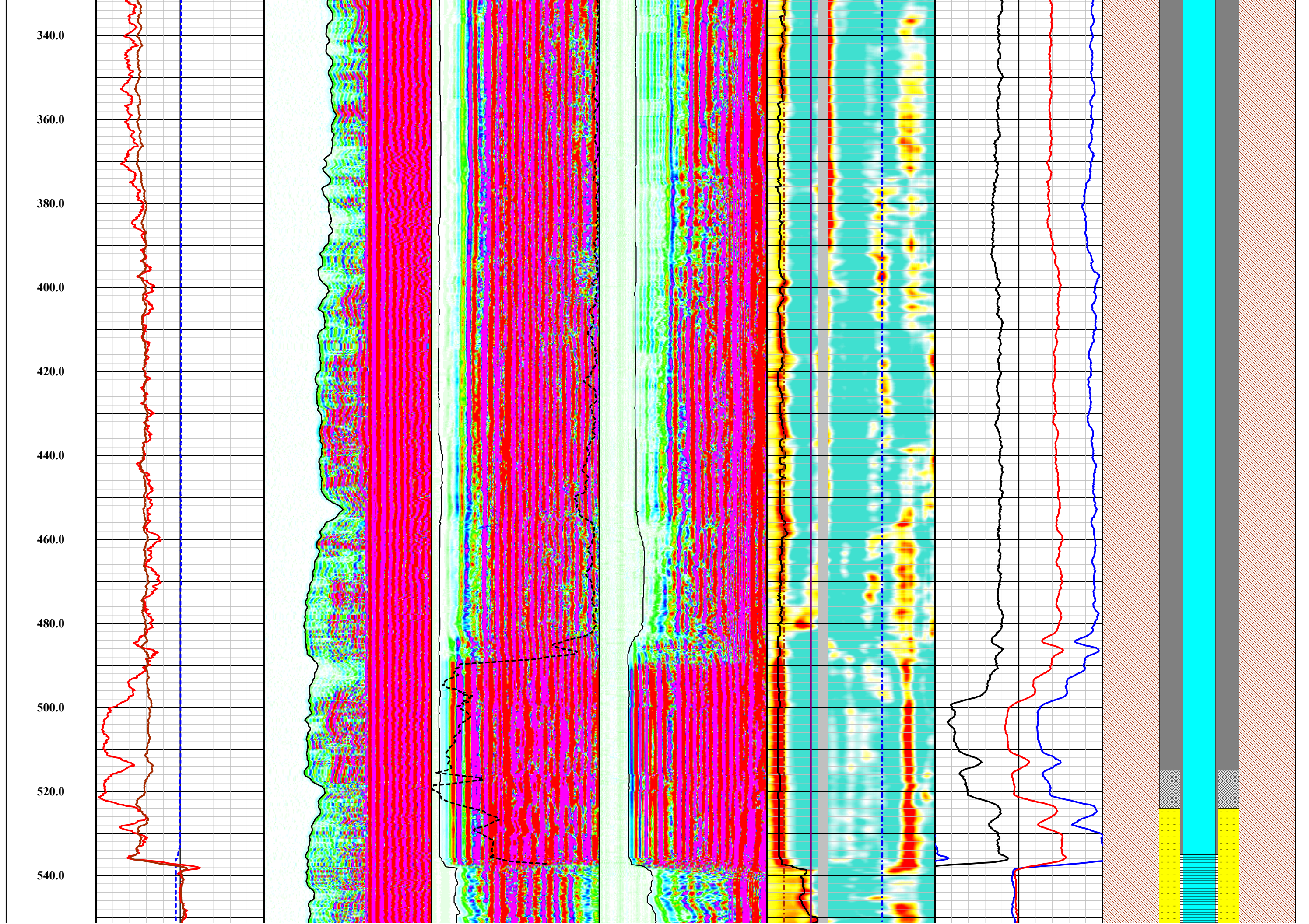


COMPANY: FLORENCE COPPER COMPANY
FIELD: FLORENCE COPPER SITE
WELL ID: M59-O
COUNTY: PINAL STATE: ARIZONA

Logging Engineer: VARIOUS
Date Logged: VARIOUS
Processed By: K.M / B.C.
Date Processed: 09-09-18







APPENDIX H

Well Development Forms

DEVELOPMENT FIELD DATA LOG

Project Name: <u>FCI</u>	Project No.: <u>129687-002</u>
Well No.: <u>M59-0</u>	Date: <u>4-6-17</u>
Location:	Measuring Point: <u>btoc, monument 2.42' als</u>
Total Depth of Well (ft bls): <u>1200</u>	Screen Interval (ft bls): <u>535-1200</u>
Pump Type/Setting (ft bls): <u>Grind 1180' btoc</u>	Activity: <u>Development w/ pump</u>
How Q Measured: <u>bucket & stopwatch</u>	H&A Personnel: <u>C Price</u>

Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Sand Content (ppm)	pH	Sp. Cond. (µmhos/cm)	Temp. °C	NTU	Comments
1420 0229	241.81								
1432	241.81								pump on
1434	262.45	17		0.3	—	—	—	0.8	dark brown
1439	262.95	17		<0.1	—	—	—	0.8	brown, drill mud
1445	263.07	17		<0.1	—	—	—	0.8	brown, drill mud
1455	17	263.50		<0.1	8.33	—	30.1	0.8	brown, drill mud
1505	17	263.18		<0.1	8.41	1179	28.5	0.8	brown
1515	17	263.30		<0.1	8.50	1270	28.3	0.8	Brown
1530	17	263.52		<0.1	8.38	1206	28.3	0.8	Brown
1545	17	263.61		<0.1	8.29	1135	28.1	0.8	Brown
1600	17	263.73		0	8.23	1112	27.9	0.8	Brown
1615	17	263.88		0	8.16	1073	28.1	0.8	Brown
1630	17	264.02		0	8.12	1053	28.1	0.8	Brown 100ml/L mud settled in 30 min
1645	17	264.04		0	8.07	1033	28.2	0.8	Brown 150ml/L
1700	20	264.11		0	8.02	1019	27.9	0.8	Brown 125
1715	20	264.26		0	7.98	1010	27.9	0.8	Brown 125 ml/L
1730	20	264.36		0	7.96	999	27.8	0.8	Brown 140 ml/L
1745	20	264.46		0	7.94	996	28.1	0.8	Brown
1746									pump off
7-7-17 0615	246.01	246.01							pump on
0620	20	265.00		<0.1	7.47	1002	27.1	0.8	light brown,
0626	20	265.19		<0.1	↓	↓	↓	0.8	
0640	20	265.59		<0.1	7.68	855	27.2	546	light brown, 45 ml/L mud
0655	20	265.77		0	7.91	898	27.1	144	cloudy, 0.6 ml/L mud
0715	20	266.00		0	7.90	935	27.3	164	cloudy 1.5 ml/L mud
0730	20	266.06		0	7.92	956	26.9	136	cloudy no mud
0745	20	266.24		0	7.91	964	27.2	134	cloudy no mud
Comments: settled mud after 30 minutes.									

DEVELOPMENT FIELD DATA LOG

Project Name: <u>FCI</u>	Project No.: <u>129687-002</u>
Well No.: <u>MSA-C</u>	Date: <u>4-7-17</u>
Location:	Measuring Point: <u>at nc monument 2.42' g/s</u>
Total Depth of Well (ft bls): <u>1200</u>	Screen Interval (ft bls): <u>535-1200</u>
Pump Type/Setting (ft bls): <u>1180' bto</u>	Activity: <u>development</u>
How Q Measured: <u>bucket + stopwatch</u>	H&A Personnel: <u>C Price</u>

Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Sand Content (ppm)	pH	Sp. Cond. (µmhos/cm)	Temp. °C	NTU	Comments
0800	20	266.38		0	7.91	966	27.4	105	cloudy
0815	20	266.48		0	7.89	968	27.6	117	cloudy
0830	20	266.71		0	7.85	967	27.7	115	cloudy, 1.8 m/L mud
0845	20	266.85		0	7.84	969	27.8	111	cloudy, 0.2 m/L mud
0930	20	267.02		0	7.81	967	28.1	66.4	cloudy,
0945	20	267.14		0	7.80	964	28.2	57.3	cloudy,
1000	20	267.23		0	7.79	966	28.2	54.1	cloudy
1018	20	267.30		0	7.77	970	28.3	51.0	cloudy
1030	20	267.39		0	7.76	965	28.2	50.0	cloudy
1045	20	267.44		0	7.74	968	28.3	41.7	clear
1103	20	267.54		0	7.73	964	28.2	40.4	clear
1130	20	267.64		0	7.72	966	28.2	36.6	clear
1202	20	267.75		0	7.72	959	28.4	36.3	clear
1204	20								pump off, letting recharge
1256	20	250.86		8	7.69	960	27.1	35.0	pump on
1259	20	264.81		0	7.69	960	27.1	35.0	clear
1302	20	265.83		0	7.70	958	29.0	131	cloudy, 0.4 m/L mud
1311	20	266.59		0	7.70	949	28.8	50.5	cloudy,
1320	20	266.72		0	7.71	958	28.7	47.5	clear
1330	20	266.84		0	7.70	952	28.4	50.7	clear
1345	20	266.91		0	7.72	953	28.5	41.1	clear
1400	20	266.98		0	7.71	958	28.2	37.2	clear
1401									pump off
1500		250.71							pump on
1504	20	265.65		0	7.79	970	28.0	945	brown,
1507	20	265.91		0	7.72	958	28.4	57.5	clear
1515	20	266.20		0	7.72	912	28.2	28.1	clear
1530	20	266.38		0	7.71	951	28.0	31.9	clear
Comments:									

DEVELOPMENT FIELD DATA LOG

Project Name: <i>FLI</i>	Project No.: <i>129682-002</i>
Well No.: <i>NS-0</i>	Date: <i>8-4-7-17</i>
Location:	Measuring Point: <i>100c, monument 2.42' ab</i>
Total Depth of Well (ft bls): <i>1200</i>	Screen Interval (ft bls): <i>535-1200</i>
Pump Type/Setting (ft bls): <i>1160' b1a</i>	Activity: <i>development</i>
How Q Measured: <i>stop watch</i>	H&A Personnel: <i>L Price</i>

[illegible]

DEVELOPMENT FIELD DATA LOG

Project Name: FCI	Project No.: 129687-002
Well No.: M59-0	Date: 4/9/17
Location:	Measuring Point: BTOL MONUMENT 2.42 ACS
Total Depth of Well (ft bls): 1200	Screen Interval (ft bls): 535-1200
Pump Type/Setting (ft bls): GROUND 1180' bbl	Activity: DEVELOPMENT W / PUMP
How Q Measured: BUCKET + STOPWATCH	H&A Personnel: C. GUSTI

Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Sand Content (ppm)	pH	Sp. Cond. (umhos/cm)	Temp. °C	Comments	NTU
4-9-17 846								PUMP ON TO RUN	
1945								PUMP OFF	
4-10-17 605	22.5	265.5		<.1	6.54	951	15.8	PUMP ON	11.6
636	21.5			<.1	6.74	823			
645	17.5	266.35						CLEAR	7.63
700	17.5			0	7.67	929	25.7		6.23
715	17.5	266.8		0	7.48	935	25.5		6.77
730	17.5	266.9		0	7.64	922	26.4		7.06
800	17.5			0	7.73	933	26.5	CLEAR / CLEAR	17.3
815	17.5	267.25		0	7.73	934	27.0	CLEAR / CLEAR	15.5
840	17.5	267.4		0	7.72	933	27.0	CLEAR	8.05
900	17.5	267.5		0	7.72	951	27.2	CLEAR	8.14
930	17.5	267.65		0	7.71	937	27.2	CLEAR	8.15
930								PUMP OFF	
1000								19 20m / L Brown CLOUDY / CLEAR	17.25
1005	18.0	266.9		0	7.72	930	27.6	CLOUDY / CLEAR	
1020	18.0			0	7.76	927	27.3	CLOUDY / CLEAR	17.2
1030								PUMP OFF	
1035								PUMP ON	
1040	18.0			0	7.77	943	27.3	CLOUDY 10m / L	21.8
1045	18.0			0	7.70	929	27.1	CLOUDY / CLEAR	19.9
1045								PUMP OFF	
1100								PUMP ON	20.8
1105	18			0	7.75	941	27.8	CLOUDY 10m / L	20.8
1110	18			0	7.70	922	27.7	CLEAR	12.6
1115				0	7.68	933	27.7	CLEAR	8.24
1115								PUMP OFF	
1130								PUMP ON	
Comments:									

DEVELOPMENT FIELD DATA LOG

Project Name: <u>CPI</u>	Project No.: <u>129687-002</u>
Well No.: <u>M59-0</u>	Date: <u>4/10/17</u>
Location:	Measuring Point: <u>BTC MONUMENT</u> <u>2.42 ALS</u>
Total Depth of Well (ft bls): <u>1200</u>	Screen Interval (ft bls): <u>535-1200</u>
Pump Type/Setting (ft bls): <u>GRIND 1180 BTC</u>	Activity: <u>DEVELOPMENT W/PUMP</u>
How Q Measured: <u>5 GAL BUCKET / 500 WATTS</u>	H&A Personnel:

[illegible]

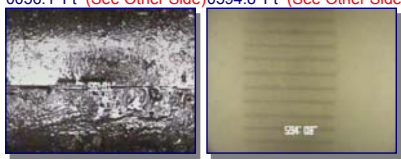


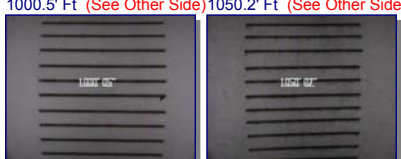
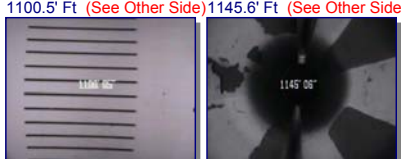
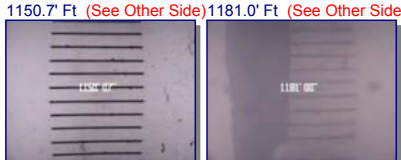
Comments:

1205 NO OBSERVED CLOUDY DISCHARGE AT EXPECTED TIME

APPENDIX I

Video Log

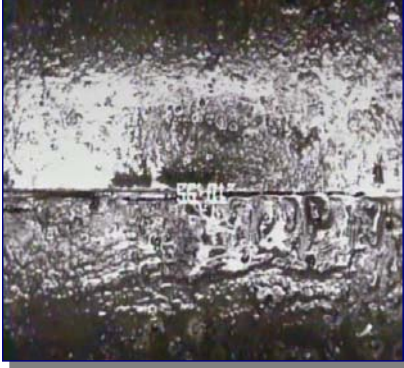
Client: **Florence Copper** Survey Date: **June 05, 2017**
 Address: **1575 W. Hunt Hwy** Invoice: **7953** Run: **1**
 City: **Florence** State: **Az** Zip: **85132** Well Name: **M59-O**
 Requested By: **Florence Copper** P.O.: _____ Well Owner: **Florence Copper**
 Copy To: **Florence copper** Camera: **1 5/8" Color Camera**
 Reason For Survey: **General Inspection** Zero Datum: **Top of Casing**
 Location: **Florence Copper** Depth: **1200 Ft** Vehicle: **290**
 Field: **Florence Copper**
 Csg. I.D.@ Surface **5.25 In.** I.D. Reference: **Measured** Casing Buildup: **None**
 Operator: **Don Eckman** Lat.: _____ Long.: _____ Sec: _____ Twp: _____ Rge: _____

Wellbore Snapshots	True Depths: (SideScan-Feet)	WELLBORE / CASING INFORMATION
0056.1' Ft (See Other Side) 0594.8' Ft (See Other Side) 		Zeroed side view at top of casing.
	263.2'	Inspected several casing joints during survey. All appeared to be in good condition.
	581'	Static water level. No visibility due to suspended material in well.
0700.2' Ft (See Other Side) 0750.0' Ft (See Other Side) 		First indication of PVC horizontal slot perforations.
	599'	Perforations appear onpen.
	610'	Visibility improving..
0850.2' Ft (See Other Side) 0950.3' Ft (See Other Side) 		Down view good.
	11489.9'	Bottom fill. End of survey.
1000.5' Ft (See Other Side) 1050.2' Ft (See Other Side) 		
1100.5' Ft (See Other Side) 1145.6' Ft (See Other Side) 		
1150.7' Ft (See Other Side) 1181.0' Ft (See Other Side) 		

Notes:

12 WELLBORE SHAPSHOTS

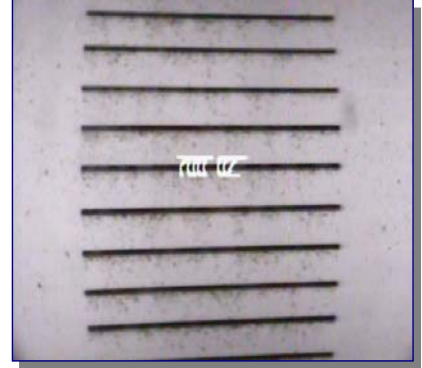
0056.1' Ft (Enlargement)



0594.8' Ft (Enlargement)



0700.2' Ft (Enlargement)



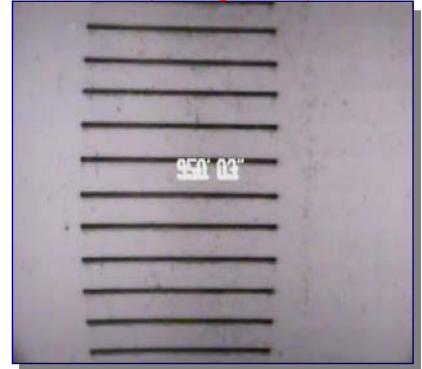
0750.0' Ft (Enlargement)



0850.2' Ft (Enlargement)



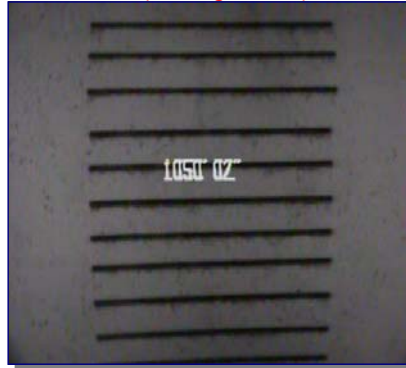
0950.3' Ft (Enlargement)



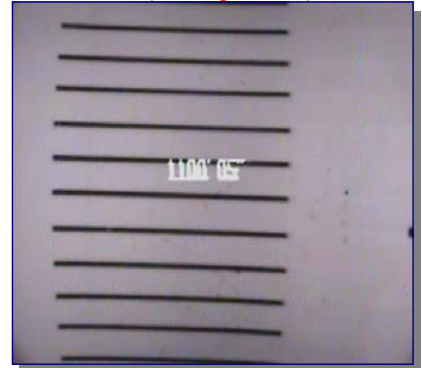
1000.5' Ft (Enlargement)



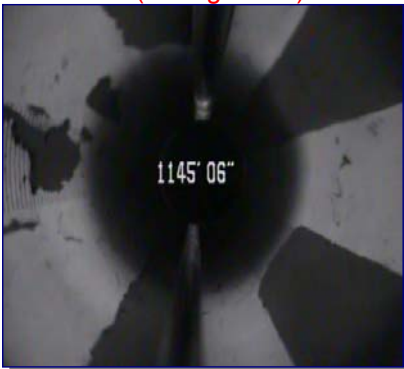
1050.2' Ft (Enlargement)



1100.5' Ft (Enlargement)



1145.6' Ft (Enlargement)



1150.7' Ft (Enlargement)



1181.0' Ft (Enlargement)

